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SCHELLING, ELLSBERG AND THE THEORY OF CONFLICT

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TABLE OF CONTENTS

FIGURES

ABSTRACT

SCHELLING, ELLSBERG AND THE THEORY OF CONFLICT

It is widely known that the book, *The Strategy of Conflict*, has influenced many scholars and decision makers since its publication in 1960. The purpose of this project is to examine what Thomas C. Schelling calls the "The theory of interdependent decision"; the motivation behind its creation and the examination of its lasting impact.

It appears that what motivated Thomas C. Schelling to write his now famous book, *The Strategy of Conflict*, stems from his dissatisfaction with the theory of games framework for the resolution of what Schelling calls "mutual dependence games" otherwise known as nonzero-sum games. Daniel Ellsberg was also dissatisfied with game theory at that time and was interested, as was Schelling, in the possible military applications of what could be characterized as the Theory of Conflict. Though, contrary to Schelling who was interested in developing the whole field of interdependent decision theory, Ellsberg was more interested in the possible applications of coercion and blackmail.

According to Schelling, this new theory could allow for the analysis and prediction of behaviors that will make possible what Schelling himself describes as the "correct use of strategy in a conflict". The potential applications of this theory are very broad: they range from the way of waging war to the art of raising children

Key words: Thomas C. Schelling, Daniel Ellsberg, Theory of Conflict, Theory of Games

RÉSUMÉ

SCHELLING, ELLSBERG ET LA THÉORIE DES CONFLITS

Il est connu dans le domaine de la théorie des jeux que le livre *The Strategy of Conflict* a influencé un grand nombre de chercheurs et d'hommes de décisions depuis sa publication en 1960.

Le but de ce projet de recherche est d'examiner ce que Thomas C. Schelling appelle la théorie des décisions interdépendantes (*mutual dependance games*) mieux connue sous le nom de jeux à somme non-nulle ; ce qui a poussé à la création d'un nouveau concept de solution ainsi qu'un grand bagage de concepts qui permet de dire qu'une nouvelle théorie prenant le nom de théorie des conflits a été créée. Nous examinerons aussi les impacts (qu'on ressent encore aujourd'hui) de celle-ci.

Il appert que ce qui a motivé Tom Schelling à écrire le livre en question *The Strategy of Conflict* prend naissance dans son insatisfaction par rapport au cadre d'analyse qu'offrait la théorie des jeux à la fin des années 50 et au début des années 60, pour la résolution de jeux d'interdépendances (*mutual dependance games*). Daniel Ellsberg, était lui aussi insatisfait avec la théorie des jeux à cette période. Ellsberg et Schelling étaient aussi intéressés aux applications militaires. Ce projet de recherche soutient ; également que c'est, d'une certaine façon, l'interaction entre les deux hommes qui a rendu possible la création de ce qu'on connaît sous le nom de la théorie des conflits.

Selon Schelling, cette nouvelle théorie pourrait permettre l'analyse et la prédiction de comportements durant une situation de conflit et permettrait de sortir gagnant de cette situation. Les applications potentielles de cette théorie sont très grandes, elles vont des comportements à adopter durant un conflit armé à l'art d'élever les enfants.

Mots clés : Thomas C. Schelling, Daniel Ellsberg, Théorie des Conflits, Théorie des Jeux

"War is a matter of vital importance to the State; the province of life or death; the road to survival or ruin. It is mandatory that it be thoroughly studied"[1]

"How much tragedy can we live with and still not have 'the survivors envy the dead'?"[2]

"But there remains another problem, the most serious for the West. The problem of sheer survival – not that we will be nibbled to death or subverted into ineffectuality, but that we will be annihilated in a blow or two, or blackmailed into accepting a series of Munichs because too many may now consider the thought of going to war to defend justice, (...) bizarre or fanciful"[3]

"The most spectacular event of the past half century is one that did not occur. We have enjoyed fifty-eight years without any use of nuclear weapons." That streak would have seemed unimaginably lucky to people in 1945 or 1950. In 1960, C.P. Snow declared it a "mathematical certainty" that thermonuclear war would erupt within a decade unless the superpowers disarmed completely and immediately."[4]

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[1] Tzu (1963), p. 63
[2] Kahn (1960), p.40
[3] Ibid, p.523
[4] Schelling (2005), p. 1

INTRODUCTION

Starting with the First World War and culminating with the Vietnam War, economic analysis allowed for the creation of decision rules applicable to military problems, the purpose of which was the optimal use of available resources. It was with the Second World War that economics as a science began to have a particularly meaningful impact on military and civilian decision makers.

The concept of maximization began to have a significant influence on military strategy during the Second World War. Maximization was used to select targets for the strategic bombing campaign that was led by the Allies on Hitler's Germany. The Allied strategists were looking for nerve points in the German war machine. Then, during the Cold War, contrary to what happened during World War II, strategists looked for ways to minimize the probability of a nuclear conflict.

In effect, during the Cold War, the emergence of the threat of nuclear war between East and West caused strategic considerations to take on an entirely different meaning. The beginning of the Cold War resulted in the expanded influence of economists in military circles essentially because of the advent of applied military economics and decision making tools developed as a result of it. This ascension started with the development of military cost-benefit analysis that aimed at minimizing costs in terms of human life, risk, capital and at maximizing enemy destruction. The influence of economists in military matters culminated with the transformation of military planning by Robert McNamara and the "Whiz Kids". These policy makers personified a new breed of technocrats who were trained as economists but were totally devoted to military thinking. Their influence in the Pentagon allowed them to play a central role in the planning of the Vietnam War[5].

Another factor that influenced the rise of strategic thinking during that period was the invention of the atomic bomb and later of the hydrogen bomb. Strategic thinking in the

[5] see Kaplan (1983), Ellsberg (2002) or Amadae (2003)

1960's consisted initially in the development of a systematic framework for armed conflicts and ultimately in the elaboration of foreign policy. The theory of games played an important part in strategic thinking particularly because of the work done on this subject by Thomas C. Schelling and Daniel Ellsberg.

This paper will deal mainly with the work of Schelling and Ellsberg. The work of these two economists, in particular, will be discussed because there are many similarities between both men. One of the most important was their dissatisfaction with game theory at the time. Both men were dissatisfied with the solution concept proposed by von Neumann and Morgenstern, and with the one proposed by Nash. Also, it will present short biographical notes on both Schelling and Ellsberg. And lastly, it will deal with Ellsberg and Schelling's work and later application of the theory.

Though they never really worked together, there is evidence that Schelling and Ellsberg corresponded and communicated with one another during the late 50's and early 60's. In fact, Schelling served as one of Ellsberg's advisors on his doctoral thesis, *Risk, Ambiguity and Decision*. Ellsberg was dissatisfied with both the solution concepts and with the question of rationality (meaning the way it was presented by von Neumann and Morgenstern). This critique was exposed for the first time in 1961 in "Risk, Ambiguity, and the Savage Axioms" and secondly in his 1962 doctoral thesis "Risk, Ambiguity and Decision", though he did lay the basis for it in 1956 in "The Theory of the Reluctant Duelist". Ellsberg did not work on decision theory for very long, although that period of his life was very intense (one could argue that his whole life has been intense!) and we have yet to comprehend all the ramifications of his work. Ellsberg's critique aimed at the very heart of game theory, which is rationality and its solution concept, whereas Schelling's dissatisfaction was not with the rationality concept and his aim was more humble. It was to develop what he considered a satisfying analytical framework in conflict. Schelling created what is now known as the Theory of Conflict, the basis of which was laid in *The Strategy of Conflict* published in 1960.

Ellsberg's interest, contrary to Schelling's, was not the development of a whole new analytical framework; his work was very important to particular aspects of the Theory of Conflict. Schelling, on the other hand, worked on the whole field of strategy and aimed to make the Theory of Conflict a totally comprehensive interdisciplinary field, able to dictate an adequate reaction to every situation. However, the similarities between the two economists do not stop with the dissatisfaction they shared with the theory of games. They both studied at Harvard. Ellsberg and Schelling both worked at RAND during the late 50's and early 60's and finally, they both publicly criticized the way the government was dealing with the Vietnam War in the early 1970's. Ellsberg was more flamboyant in his criticism than Schelling. This is a good reflection of their personalities; Ellsberg never did mind changing the system, whereas Schelling wanted to make things work within the framework of the existing system.

Thus, Ellsberg, because of his dissatisfaction with the Vietnam War policy, decided to release what are now known as the *Pentagon Papers* to the press. Schelling, on the other hand, decided along with other Harvard professors who had all served as presidential advisors at one time or another to meet Kissinger personally to tell him they did not want to be part of the Vietnam War policy anymore. Even though Schelling, after his break with policy, could no longer have access to the high level government information, as he did before the break, he continued his work in economics; he simply changed the focus of his research, whereas Ellsberg does not come through entirely as such. He completely abandoned economics after releasing the *Pentagon Papers* to entirely devote himself to being an anti-war activist.

It is true that both Schelling and Ellsberg were dissatisfied with the game theory framework and that this dissatisfaction motivated them to further their research in that field. But were that their only motivation, how could one account for their interest in the military strategy? The answer to that question must reside in the atmosphere that the RAND Corporation helped create. There will be a later discussion of that atmosphere.

But firstly, who are Thomas Schelling and Daniel Ellsberg? Many know Ellsberg as an anti-war activist, but few people know he had an economic background or that he had worked on decision theory. Schelling, on the other hand, is known for his work on micro-motives, focal points and urban development. But what initiated all this? The following should help answer these questions.

A reader might also want to have a look at the concept plan on Appendix C to have a general comprehension of the paper. At the same time the reader will be able to see the ramifications of conflict theory and the influences exerted on its creators.

CHAPTER I

THOMAS C. SCHELLING

Schelling was born in 1921 in Oakland, California. He received a bachelor's degree in economics in 1943 from Berkeley University, he then went on to further studies at Harvard where he received his doctorate in 1951. In 1948, Schelling worked with U.S. ambassador Averell Harriman on the negotiation of the Marshall Plan. This experience in negotiation had a lasting influence on him. Eventually, he started teaching at Yale (1953), then moving to Harvard. He also spent a period of time at RAND in 1958 where Ellsberg also worked during the same period. Schelling has now retired from teaching, but still gives the occasional lecture. October 10th 2005, was the consecration of a lifelong dedication to his field of study. The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel of 2005 was awarded to him and Robert Aumann for their contributions to the enhancement of the understanding of conflict and cooperation behavior through game theory.

Schelling's first publications were conventional as they were published in *Econometrica* (1946), the *American Economic Review* (1947 & 1949) and the *Review of Economics and Statistics*. His first book, *National Income Behavior*, which he published at age 25, was also very conventional. It analyzed the gross domestic product calculus, problems relating to economic policy and fiscal policy. It was with his second publication, *International Economics* (1958), that Schelling started to gain widespread attention. In fact, after reading *International Economics* Robert Solow wrote; « (...) *International Economics* picks up on such topics as foreign aid negotiations and cost-sharing arrangements (...) and it talks about

them in characteristic ways that an ordinary economist would never have thought of. »[6]. In fact, the last two chapters of this book are quite interesting since they announce things to come. The chapters are entitled:

- *Economic warfare and strategic trade controls*
- *Trade controls and national security*

In these chapters, Schelling illustrates the strategic implications of economic exchanges between allies and between enemies. His intention is not to criticize the structure that was already in place at that time; that is the "*Mutual Defense Assistance Control Act*". The law renders American economic and military support to countries conditional on participating in the embargo on exporting strategic goods to the Soviet Union. In order to better understand the implications of this law, we must first look at the definition of a strategic good. It is defined as follows: "items (...) used in the production of arms (...)"[7] The executive branch of the American government also used the following criteria to ascertain the importance of certain strategic goods:

1) How an item can be used in war;
2) How it can be converted to war use;
3) How it contributes to military production
4) Whether its control would cause a critical deficiency in the Soviet war economy; and
5) Whether the item embodies information useful to the Soviets in war production.[8]

Subjectivity in the criteria is mentioned by Schelling, but he does not really focus on it.

Schelling prefers to apply himself to showing the perverse effects of the embargo. For example, when a government restricts the sale of strategic goods such as planes or parts that are used in the assembly of planes to an enemy state and allows for the sale of something that sounds as inoffensive as bicycles for example, it still indirectly assists the enemy with the production of strategic goods. This is so because, the enemy state can now free the production capacity that would have been taken by the production of bicycles and specialize

[6] Zeckhauser (1989)
[7] Schelling (1958), p. 498
[8] Ibid, p. 498

in the production of planes. It is rather simple economic analysis, but if we believe Robert Solow, nobody had thought of it before. Schelling's work is not driven by highly technical tools, but, according to Solow, it focuses on a subject, it looks at it, like no one else would.

In 1960, with the publication of *The Strategy of Conflict*, Schelling caused quite a stir in the strategic thought community. Almost the entire book had been published in various scientific articles between 1956 and 1959. His admitted aim was to create a new academic discipline that would be known as the theory of conflict. This new discipline studies the actions that an agent must take to be able to win a contest or get the better of an opponent in a particular situation. Here again, Schelling relies on simple game theory tools. In order to give more weight to the ideas he puts forth in the book, Schelling used experimental economics, which was quite original at the time but was used at RAND. There will, naturally be further discussion of these tools and what impacts *The Strategy of Conflict* had on game theory and U.S. foreign policy.

1.1 Thomas Schelling and the origins of conflict theory

The ideas Thomas Schelling brought to light with the publication of *The Strategy of Conflict* made quite an impression on the game theory circle. What he proposed would profoundly change strategic thinking. As a matter of fact, he considered war, as did Machiavelli and von Clausewitz, as a form of negotiation, a violent form of it, but negotiation nonetheless. Schelling came to the conclusion that the existence of conflicts is inevitable. It is because of this inevitability that one has to study the behavior that is associated with any form of conflict. By studying the behavior associated with conflict and also the behavior that should be adopted in conflict, Schelling sought to find a way of minimizing the cost and duration of a conflict. To do so, he emphasized the limited use of violence in order to communicate to the other party that one has a reserve force that would allow one, if necessary, to cause much more damage than was first threatened.

One of the bases of the Theory of Conflict or the theory of interdependent decisions (as Schelling first wanted to call the new theory) is Schelling's analysis of negotiation and coordination problems. As already stated, Schelling was not satisfied with Nash's 1950 and 1953 bargaining solution concept. One of the motivations behind conflict theory is that its author wanted to create a solution concept that would better reflect reality; this being what Schelling finds the most problematic with Nash's solution concept.

In order to better understand Schelling's dissatisfaction, the following is a short discussion of the theory of games as seen by Nash.

1.2 Theory of Games according to Nash

1.2.1 John Nash

John Nash was born on June 13th, 1928 in Bluefield, West Virginia. He was the son of an electrical engineer and of a teacher. By the time he attended high school, Nash was conducting scientific experiments in his room and he had also read *Men of Mathematics* by E. T. Bell. Also by that time, Nash had proved the classic Fermat theorem.

Nash entered the Carnegie Institute of Technology (which is now Carnegie Mellon University) in 1945 on a Westinghouse Scholarship as a chemical engineering student. He disliked the courses and the fact that, it was not "(...) a matter of how well one could think and understand or learn facts but how well one could handle a pipette and perform a titration in the laboratory."[9] Encouraged by the mathematics department, he decided to become a mathematics student. Upon graduation, his mathematical skill and knowledge allowed him to get an M.S in addition to his B.S.

In 1948, Nash decided to attend Princeton as a postgraduate student and "(...) quickly completed a Ph.D under the supervision of Albert Tucker."[10] In fact, Nash had completed his Ph.D thesis on "Non-cooperative games" by the spring of 1950. The thesis contained the

[9] Nash (1994)
[10] Leonard (1994)

definition of what would be later known as the Nash Equilibrium. The thesis is, for the large part, reproduced in a 1951 *Annals of Mathematics* article with the same title as the thesis. Instead of developing a theory of n-person cooperative games as von Neumann and Morgenstern did, Nash develops a theory based on the absence of cooperation. In his work, "(...) each player is assumed to behave independently, without any collaboration or communication with the other players."[11] The essence of Nash's theory is the notion of equilibrium[12] which he defines as,

> "[...] an *n*-tuple $s = (s_1, \ldots, s_n)$ is an equilibrium point if, for every *i*, we have: $p_i(s) = \max_{r_i} p_i(s_i, r_i)$, where $p_i(\,)$ is player *i*'s payoff and $p_i(s,r_i) = p_i(s_1, \ldots, s_{i-1}, r_i, s_{i+1}, \ldots, s_n)$. In words: An equilibrium point is an n-tuple s such that each player's mixed strategy maximizes his payoff if the strategies of the others are held fixed. Thus each player's strategy is optimal against those of the others"[13]

Nash then defines the concept of a solution. A game is considered as being solvable if its set *S* of equilibrium points satisfy what Nash calls an interchangeability condition. This condition states that $(t, r_i) \in S$ and $s \in S$ implies that $(s, r_i) \in S$ for all *i*. In words, "[...] a game is *solvable* if its set of equilibrium points are interchangeable, i.e. if any player can choose freely a strategy from any of her equilibrium strategies and the result remain an equilibrium points."[14] Nash then goes on to examine the notion of strong solvability, the notion implies that "[...] a game is strongly solvable if it has a solution *S* such that, for all *i*, $s \in S$ and $p(s, r_i) = p_i(s)$ imply $(s, r_i) \in S$, that is, if every unilateral deviation from an equilibrium *n*-tuple causing no change in the payoff still determines an equilibrium *n*-tuple." Thus, Nash defines a solution to non cooperative game such as, "[...] a set of equilibrium points such that the equilibrium strategies of the players were (are) interchangeable."[15]

Schelling's dissatisfaction, however, did not lie with the Nash equilibrium but with Nash's contribution to bargaining which was also very original and important ("The Bargaining

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[11] Giocoli (2004)
[12] Nash had already presented this notion in his 1-page paper published in the Proceeding of the National Academy of Science, "Equilibrium in n-Person Games" in 1950. This presentation is slightly different from the one in his thesis. In the 1950 paper, Nash uses a Brouwer criterion to prove the existence on an equilibrium point and in his thesis he uses a Kakutani criterion.
[13] Giocoli (2004)
[14] Leonard (1994)
[15] Giocoli (2004), (parenthesis mine)

Problem", April 1950 and "Two-Person Cooperative Games", January 1953). Before Nash, economists thought that the result of two parties bargaining was dependent on an imprecise notion called "bargaining powers"[16]. Nash did not build his solution upon what he saw bargainers doing. Instead, Nash seems to ask himself: "What would a good solution look like? This is reportedly how he found many of his answers and why they were so original[17]. One could also contend that a reason why Nash's work on bargaining was so innovative was because he had started working on bargaining before he had training in the field of economics (Leonard, 1994). In effect, "The Bargaining Problem" was written for an elective class in international economics which he took while still at Carnegie. This seems to have been Nash's only formal training in economic theory. "The Bargaining Problem" presents an axiomatic treatment of the two person bargaining problem and shows how, given certain "reasonable" requirements, "(...) the only feasible solution is that which maximizes the product of the player's utilities"[18]. The axioms or assumptions Nash exposed were a short list of "reasonable" or sensible-sounding conditions that a good solution should respect. The axioms or assumptions are the following[19]:

Given F that denotes an arbitration scheme which maps a typical bargaining problem [R, (u^*, v^*)] into a arbitrated outcome, Nash contended that a solution must respect the following assumptions:

1) Invariance with respect to utility transformations. Let $[R_1, (u_1^*, v_1^*)]$ and $[R_2, (u_2^*, v_2^*)]$ be two versions of the same bargaining game, i.e., they differ only in the units and origins of the utility functions. Then the arbitrated values functions $F[R_1, (u_1^*, v_1^*)]$ and $F[R_2, (u_2^*, v2^*)]$ shall be related by the same utility transformation.

In other words, a solution to a bargaining situation does not depend on the way a player measures his satisfaction.

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[16] This notion is attributed to von Neumann and Morgenstern and will be treated later on.
[17] Leonard (1994) reports that Shubik, who was roommate of Nash, says that Nash was known for reading "hardly anything". And this was "(...) probably one reason for his success because some of the problems he solved were one which the experts had given up on as hopeless". One can also refer to Sylvia Nasar's biography of Nash for a general impression of the man.
[18] Leonard (1994)
[19] The assumptions are taken from Luce and Raiffa (1957).

2) Pareto optimality. A solution to a bargaining situation (u_0, v_0) shall have the following properties:

   i. $u_0 \geq u^*$ and $v_0 \geq v^*$

   ii. (u_0, v_0) is a point of R_1

   iii. There is no (u,v) in R, different form (u_0,v_0), such that $u \geq u_0$ and $v \geq v_0$

The agreement that the two players reach has i) to be at least as good as the utility value of the status quo, ii) to be within the realm of possibilities and iii) to maximize the utility levels of the players in such a way that there can not be another possible point that can better the utility value the agreement gives the players.

3) Independence of irrelevant alternatives. Thus suppose $[R_1, (u_1^*, v_1^*)]$ and $[R_2, (u_2^*, v_2^*)]$ are two games and that:

   i. R_1 is a subset of R_2

   ii. $F[R_2, (u_2^*, v_2^*)]$ is in R_1

   Then, $F[R_1, (u^*, v^*)] = F[R_2, (u^*, v^*)]$

$[R, (u^*, v^*)]$ being the solution of a bargaining problem.

Thus, if new trade possibilities are added in a way that the status quo does not change, the solution remains the same. It cannot be influenced by the new trade possibilities.

4) Symmetry. Suppose the version $[R, (u^*, v^*)]$ of a bargaining game has the following properties:

   i. $u^* = v^*$

   ii. If (u,v) is in R; the (v,u) is in R

   iii. $(u_0,v_0) = F[R, (u^*, v^*)]$

"In words, if an abstract version of a bargaining game places the players in completely symmetric roles, the arbitrated value (solution) shall yield them equal utility payoffs, (...)"[20] According to the fourth assumption, if two players have similar negotiation positions, they will receive symmetric payoffs[21].

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[20] Luce and Raiffa, p.127 (parenthesis mine)

[21] On the other hand, von Neumann and Morgenstern's stable-points (the result of bilateral bargaining) are dependent on custom and thus, quite vague, (the use of the fictitious player in n-person games, also did not contribute to a precise outcome to bilateral bargaining). The von Neumann

The Nash bargaining solution satisfies these four assumptions and as Luce and Raffia say, "(...) it is the only function which does so"[22].

Schelling's dissatisfaction with Nash's bargaining solution lies in the fourth axiom. In effect, Nash explicitly postulates symmetry, and as John Harsanyi writes when discussing Nash's solution; "Intuitively the assumption underlying this axiom is that a rational bargainer will not expect a rational opponent to grant him larger concessions than he would make himself under similar conditions"[23]. Reacting to this, Schelling adds, "It is the moves that are interesting, not the game without moves; and it is the potential asymmetry of the moves that makes them most interesting"[24]. Thus, what Schelling's critique implies is, 'Why should players even play since the expected outcome is a draw?' In such a situation, players are not even required to play, since the solution is self-evident. The solution would be a tie. Also, and this explains why tacit communication is central to the theory of conflict, Schelling believes that any bargaining game gives way to a tacit bargaining process. The reason for this is that since both players come to expect a draw, the only way to deviate from this situation is to try to influence the solution by commitments, for example. In Nash's negotiation process, players are required to make offers. In Schelling's version, a nuance is added specifically stating that "(...) a player can make a 'final' offer, a 'commitment'; whoever can record an offer favorable to himself and known to the other, and leave the room, has the winning tactic."[25] For Schelling, in order to come out on the winning side in a conflict, one has to make "(...) the other player choose in his favor"[26]. In fact, this notion is central to conflict theory. One must always try to get the opponent to choose in one's favor.

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and Morgenstern solution offered the whole set of Pareto efficient allocations. For Nash, the outcome resulting from a negotiation process is obtained by the individual bargainers acting in their own interest. This strategy combination is an equilibrium strategy combination if every player's response is the best response to the strategies of all the other players. Consequently, there is nothing a player can do independently that will increase his payoff.

[22] Luce and Raiffa (1957), p.127

[23] Harsanyi, (1957) in Schelling (1960a), p. 279

[24] Schelling (1960a), p. 277-8

[25] Ibid, p. 276

[26] Ibid, p. 276

Schelling adds that even when commitments are made, there is still room for symmetry. However, this symmetry is of a different kind; it is not achieved through bargaining but rather by each party iteratively suggesting a solution until a final solution, deemed acceptable by both parties, is found. To facilitate this process, the party which may place a "final offer" is determined arbitrarily (e.g. coin toss) at the beginning of the negotiation. Thus, in this kind of symmetry, each party has an equivalent probability of having the final offer.

In order to allow for what Schelling calls "non symmetry" (in opposition to Nash's symmetry) he had to find a way of separating symmetry from rationality. "We must have a plausible definition of rationality that does not mention symmetry and show that asymmetry in the bargaining expectations would be inconsistent with that definition."[27] Note that Schelling wants to show that it is not asymmetry that should be considered as rational but, what he calls, non symmetry.

Schelling compares symmetry in game theory to a foot race where everybody runs exactly at the same speed. If everyone is as fast as everyone else and, "(...) since a tie is a foregone conclusion, why would they bother to run?"[28] For Schelling, by tying rationality to symmetry together, the game theorists are shooting themselves in the foot. In effect, "(...) the assumption of complete symmetry of behavior as a recognized foregone conclusion seems to preclude the very kind of action that might have seemed to enrich the game at the stage of preplay communication."[29] For Schelling, symmetry not only does not permit the analysis of very interesting actions but can also become an obstacle to achieving a solution to a bargaining situation, thus limiting the chances for the players of reaching an agreement. Before looking at how, according to Schelling, symmetry can be an obstacle to reaching an agreement between the two players, one has to understand how Schelling defines an agreement.

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[27] Schelling (1960a), p. 281
[28] Ibid. p. 281
[29] Ibid. p. 273

Schelling argues that the notion of agreement has never been sufficiently examined, or sufficiently operationalized (which is necessary for Schelling since his aim is to transpose his solution concept to real bargaining situations). Furthermore, Schelling is not satisfied with Luce and Raiffa's definition of an agreement[30]. Their definition of a trade (or an agreement) is, "(...) an actual reapportionment of the joint bundle of goods held by them (the players)"[31]. Also, for Luce and Raiffa, a trade will take place only if each player consents to it and for a trade to occur, it has to respect the four assumptions Nash put forward, and that have been mentioned earlier. Thus, they find Nash's solution concept acceptable.

Schelling, however, believes that an agreement consists of two offers (one from each player) that are compatible. In order for the offers to be compatible, the players must jointly claim what is available for them to divide between the two of them. If the offers are not compatible, if "the two players have claimed more then is available"[32], there is "disagreement" and if a disagreement occurs, the players receive nothing. If the offers are compatible, an agreement is reached and the players receive what they have agreed to. For an agreement to be reached, there have to be only two current offers. In order to insure that there are two and only two "current offers", Schelling puts forth the idea that, a bell could ring to indicate to the players that there is only enough time for them to prepare one final offer. A third party, a referee for example, could then examine each player's current, or final, offer and determine if the offers are compatible. The players do not really need to be present in order to play the game. They simply have to write down their final offers and the referee has to open the envelopes, when the time limit has expired and determine if the offers are compatible. The game loses its cooperative and move-symmetrical aspects, and so becomes a tacit, non cooperative game. There are many implications to this conclusion, some of which will be examined later on.

We must now return to the examination of why symmetry is not only unnecessary but can be an obstacle to achieving an agreement. For example, if two players have to divide 100 objects between them, the agreement the two players reach must explicitly mention "which

[30] Luce and Raiffa (1957) call a solution a trade, as for Schelling, a solution is an agreement.
[31] Ibid, p.124 (parenthesis mine)
[32] Schelling (1960a), p. 269

individual items go to which individual players"[33]. So, in order to reach an agreement, the players must propose identical divisions of the objects. The probability of the players reaching such an agreement is quite low, unless communication is permitted. For Schelling, the player that would be able to communicate the last offer would have a very big advantage. In effect, since the chances of the players concerting their offers are so low, the other player (the one that did not communicate the final offer) would be forced to accept the last offer communicated thus giving the advantage to the other player, simply for the sake of finding an agreement. The player is expected to agree, since, in order to respect rationality, he must act in order to maximize his utility. But by allowing the symmetrical behavior, a player would try to drown out all communication in order to not be able to hear (understand) the other players' offer, thus evacuating preplay communication (and, as said before, what Schelling finds interesting).

One has to keep in mind that what Schelling was trying to achieve was a theory where players did not have to settle for a tie through the bargaining ritual. He was striving for a negotiation model that allowed players to actively negotiate and to resolve conflicts by achieving a truly equitable solution.

According to Schelling, every negotiation situation has the potential of becoming a tacit non cooperative game. Thus, there is no need for the symmetry axiom, as we have seen earlier. For example, in a game where two players (individuals) must divide 100$ between them and, at the end of the game, if the players arrive at a solution where player A is to get 80$ and player B gets 20$, Schelling considers that such a solution does not contradict the rationality rule because;

> "Specifically, where is the 'error' in B's concession of $80 to A? He expected – he may tell us, and supposes we have means to check his veracity (a modest supposition if full information of utilities is already assumed!) – that A would 'demand' $80; he expected A to expect to get $80; he knew that A knew that he, B, expected to yield $80 and be content with $20; he knew that A knew that he knew this; and so on. (...) Both were correct in every expectation."[34]

[33] Schelling (1960a), p. 271
[34] Ibid, p. 281

Schelling also adds that since there is an enormous number of possibilities (9 999 if the 100$ is to be divided to the nearest penny), the players must be "helped" by some kind of "coordination device". This is where focal points come into play. Thus, Schelling introduces a new concept, focal points. These points help the players to focus on one specific solution. Focal points imply tacit communication. This is the reason why, in order to have focal points, one must allow for the existence of tacit communication and thus non symmetry; "(...) it is the observable phenomenon of tacit coordination that provides empirical evidence that (sometimes) rational expectations can be tacitly focused on a unique (and perhaps efficient) outcome, (...)"[35]. The empirical evidence to which Schelling refers will be treated later on. What Schelling is saying is that players should not simply expect an outcome which corresponds to that which one party deems potentially acceptable to the opposing party. The players should accept the power of the game to "dictate its own solution through their intellectual capacity to perceive it (...)[36] The intellectual capacity, Schelling is referring to, is a concept that he calls focal points. According to Schelling, what Nash's theory needs is simply "(...) the premise that a solution exists (...)"[37].

Schelling thought, as did Nash, that coordination was at the heart of negotiation problems. The solution to these problems is not to impose artificial restrictions, nor does it cease to be a problem if the information is perfect.

> "Most bargaining situations ultimately involve some range of possible outcomes within each party would rather make a concession than fail to reach agreement at all. In such a situation any potential outcome is one from which at least one of the parties, and probably both, would have been willing to retreat for the sake of agreement, and very often the other party knows it. Any potential outcome is therefore one that either party could have improved by insisting; yet he may have no basis for insisting, since the other knows or suspects that he would rather concede than do without agreement. "[38]

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[35] Schelling (1960a), p. 289
[36] Ibid, p. 279
[37] Ibid, p. 289
[38] Ibid, p. 70

Schelling emphasizes the dynamic aspects of negotiation. His model requires no artificial restrictions. The only restrictions that are required are a time limit and the assurance that if players come to terms (before the deadline), the terms of the deal will be applied. With these limited restrictions, Schelling was able to show that equilibrium was possible in games of negotiation and that this equilibrium was similar to the Nash solution. To explain these solutions, Schelling uses the focal point concept. Focal points imply that two partners (or enemies) without means of communication will find an identical solution to a game. This notion is also derived from, and presumes the relevance of, the rationality concept.

1.3 Focal Points

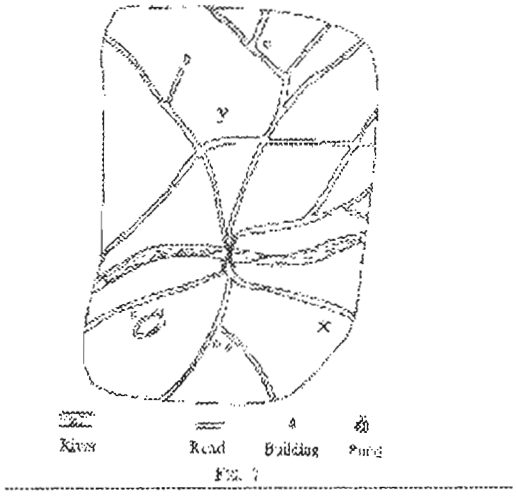

Figure 1: Map that was used by Schelling[39] when conducting experiments on focal points

To better the understanding of focal points, Schelling decided to conduct experiments in his Harvard classes[40]. For example, the students were given a situation: Two paratroopers, with no means of communication, only have a map of the region where they are about to be dropped and, must find a way to meet each other. In order to do so, the players must find the best possible meeting point. The majority of players (students) succeeded in finding a common meeting place on the map. This meeting point was usually a bridge or an

[39] Schelling (1960a), p. 55

[40] It is not clear whether it is in an effort of trying to prove the existence of focal points that Schelling conducted experiments or if it is after conducting these experiments that he discovered focal points.

intersection. Since a majority of players did succeed in meeting each other, Schelling's intuition, that focal points existed, was confirmed. For a point to have a focal quality, it has to be unique. In the scenario illustrated above, there are a number of houses but only one bridge. Thus the bridge is the focal point (simplicity is very important).

Schelling also conducted experiments where subjects had to share a certain amount of money, 100$ for example. If the amount was perfectly shared (that is to say that the sum of the parts was not greater then 100$), the players received what they had asked for. What Schelling's experiment allowed him to discover was that the amount was shared, more often then not, 50/50 between the players. This prompted Schelling to see the 50/50 split as a focal point. This finding seems to confirm the need for symmetry, as with Nash's bargaining solution (in fact the 50/50 split is the Nash solution). Schelling admits that in bargaining games where players must coordinate their offers to win a prize or obtain what they have offered, the results will, more often then not, be the Nash solution. Even if this seems to contradict what Schelling is trying to do, it is not so. It is the focal quality of the Nash solution that renders it so attractive to players and; "(...) that in turn takes the heart out of any player in the explicit bargaining game who might hope that the expectations could focus anywhere else."[41]

Focal points are also a very important part of Schelling's discussion of arms control. It is a subject that very much interested Schelling between 1960 and 1961. He published five articles and a book (co-authored by Morton Halperin) on the subject. Schelling's approach to arms control relies heavily on tacit bargaining and is also very pragmatic (this applies to nearly all the subjects he touches). He preaches the control of arms, not their abolition. The abolition of arms would give way, according to Schelling, to a very unstable stance since there is a very big advantage conferred to the cheating party. The cheating party does not have to acquire a large quantity of arms in order to gain a very big advantage on the honest party. There follows a discussion of Schelling's study of arms control.

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[41] Schelling (1960a), p.289

1.4 The Theory of Conflict and Arms Control

With the publication of "Surprise Attack and Disarmament" in *The Bulletin of the Atomic Scientist* in September 1959, Schelling announced a small transition in conflict theory. His work would now include arms control. Schelling even tried to get the public involved in the debate (see *New York Times* article, Appendix B). One of the impacts the Theory of Conflict could have would be hasty conclusions to conflicts or wars. The conflicts would be over before both arms stockpiles were exhausted. The advantages to an early conclusion to any kind of conflict (conventional or nuclear) do not have to be enumerated, and neither does the fact that human lives would be saved. Also, Schelling may have wanted to study arms control for another reason. Being an informed and well-read man, he must have known of the reasons for the rise of the Third Reich in Germany in the 1930's. One of the reasons was that the German people felt humiliated by the Versailles Treaty of 1918 and especially by the clause that limited their army to 100 000 men; "But what hurt the most was that Versailles virtually disarmed Germany and thus, for the time being anyway, barred the way to German hegemony in Europe"[42] However, having arms left over brings on the problem of controlling them and monitoring them.

Military technology changes at a very fast pace and negotiations between the U.S. and the USSR, for example took very long periods of time. In fact according to Schelling, negotiations take so much time that it is nearly impossible to reach a deal.

> "We and the Russians are trapped by our military technology. Weapon developments of the last fifteen years, especially of the last seven or eight, have themselves been responsible for the most alarming aspects of the present strategic situation. They have enhanced the advantage, in the event war should come, of being the one to start it."[43]

Thus, we are somewhat the slaves of our own creations. Schelling adds, "(...) nature might have been kinder in the way she let our military technology unfold itself over the last decade

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[42] Shirer (1960), p. 58
[43] Schelling (1960b)

and a half."[44] Before the parties negotiate a deal that is acceptable to both (a deal that does not give undue advantage to any party), changes (in weapon technology, for example) could occur and negotiations would have to start all over again. One way of making a deal, according to Schelling is to use tacit communication. In fact, that is what happened with nuclear testing, "(...) (a) moratorium resulted from no detailed negotiations, no careful specifications, and no written documents to be initialed and ratified."[45] The moratorium was not the result of a summit conference. Schelling proposes that one of the parties act (or abstain from acting) and dare the other party into doing the same. Once again this kind of deal is subject to focal points and tacit communication. Simplicity as always, is to be used. It is rarely possible to communicate matters of degree whereas the fact that one abstains from a certain action is easily communicated.

Schelling (like Halperin) even thinks that there should be room for interpretation in arms treaties. There should be room for tacit communication and tradition in these treaties, "(....) it is not necessarily true that every effort should be made to make the agreement as detailed as possible (...)"[46]

Pursuing his ideas on arms control, Schelling proposes what he calls a *Special Surveillance Force* that would be established in parallel with the Russians and perhaps other countries. Its purpose would be to "observe the enemy's behavior, at the enemy's invitation, and to report home instantly through authentic channels."[47] It was to be an idea that Schelling would pursue over the next few years. The importance of communication and focal points is once again put forth. In effect, since the *Force* could act as an intermediary, the messages that each party wished to convey would get through without any distortions. The *Force* would also be able to investigate suspicious incidents such as a nuclear meltdown, so as to assure their respective countries that the incident was truly an accident and was not a provocation. Schelling admits that the establishment of such a force would be difficult, though worth a try.

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[44] Schelling (1960b)
[45] Ibid
[46] Schelling and Halperin (1961), p. 87
[47] Schelling (1960c)

Aware that the idea of the *Special Surveillance Force* was not catching on, Schelling's further work focused on the role that NATO could play. He thought that it could perhaps have a role similar to, though smaller than, his *Special Surveillance Force*. But he also wanted to stabilize the alliance, since he thought that there were two different pressures on the members of the Atlantic Alliance; one was that the members wanted to have the widest range of action possible and the other that NATO could only be effective through mutual responsibility.

Focal points are also of particular interest for the Theory of Conflict since they can be used in situations of limited war, which is a conflict where participants respect certain boundaries (the boundaries can be implicit or explicit). For Schelling, it is possible for two parties to respect certain limits without explicit communication. Implicit communication (or tacit bargaining) uses focal points since players respect certain boundaries that are not to be crossed, without explicitly communicating them.

1.5 The Theory of Conflict and Accidental wars or surprise attacks

In the early 60's, Schelling was also preoccupied with accidental wars. Before discussing Schelling's work on accidental wars, one might ask: What is an accidental war? Firstly, one has to specify that accidents do not cause wars. People do, by the decisions they make. "The point is that accidents do not cause war. Decisions cause war"[48]. A definition of an accidental war could be: a conflict that is not explicitly caused by one of the parties (or a third party) involved, but by an accident that could not be controlled by any of the parties.

Schelling attempts to demonstrate that tacit communication and focal points play a major role in the avoidance of accidental conflict and in support of arms control (as we shall see, one goes with the other). The importance of avoiding accidental wars is self-evident; both parties could destroy one another. The U.S. could destroy the USSR, and the reverse is also

[48] Schelling (1960c)

true. Also true, is that if one of the involved parties decided to launch an attack, the other would be under the obligation to respond in at least an equivalent manner. Since both parties have the capability of destroying one another (and the rest of the world for that matter!), what would be the importance of who attacked whom? What is important is to know that none of the involved parties is interested in surviving the other by a day[49]. This type of affirmation brings to mind Albert Wohlstetter's concept of the "Balance of Terror"[50] (to which there will be a later reference because of his influence on the Air Force while at RAND). Wohlstetter, in his 1959 article, says that as long as none of the parties is assured of surviving the other's attack, no party would want (or be tempted) to launch an attack. This Balance of Terror is an illustration of such a situation. The balance is fundamentally stable: there is stability as long as none of the parties involved finds a way to render his arms or population invulnerable to the opponent's attack. The invulnerability could be caused by one's first-strike capabilities or a highly efficient civil defense program[51]. Were there invulnerability, then the balance would not be stable, it would lean to one side since it could lead to a preference towards a counterforce strategy and subsequently lead to world destruction.

Another important factor in Schelling' discussion of accidental wars is the reaction time. If one of the parties could give itself time to verify whether the presumed attack is real or not, the risks of an accidental war happening would be much less. One of the ways of increasing the reaction time is by protecting one's attack capabilities against an aggression. Ellsberg also worked on this type of problem, as was said before. There are many ways to protect one's attack capabilities; for example, one could put them underground. With the arms well protected one could assure oneself that the presumed attack is indeed true.

One has to admit that the "wait and see" reaction seems improbable, but what Schelling is trying to accomplish, is to stabilize the balance as much as possible, to use Wohlstetter's concept. The risks of an accidental war are exponentially augmented if one cannot wait and see,

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[49] This type of affirmation is recurrent in the literature.
[50] Wohlstetter (1959)
[51] Civil defense was preached by Herman Kahn, but that would be the topic of another paper.

> "If a country's retaliatory weapons are reasonably secure against surprise attack, pre-emptive or premeditated, it need not respond so quickly. Not only can one wait and see, but one can assume that the enemy himself, knowing that one can wait and see, is less afraid of a precipitate decision, less preoccupied with his own need to pre-empt."[52]

The balance image is frequently used to describe the position of the superpowers during the second half of the twentieth century.

Another area where tacit communication plays a major role is in the prevention of surprise attacks. Once again, it is by using tacit communication that one can assure one's enemy that the Balance of Terror will remain stable.

According to Schelling the best way of minimizing the risks of an accidental war is to have the other party perceive that a preemptive attack is highly improbable. Preemption should never be a conservative stance. Tacit communication plays a major role in achieving this goal since the enemy is always watching. One has to communicate a pacifistic (or at least non-aggressive) attitude through one's actions. Once again simplicity is very important. The parallel with the second Gulf War is evident (for some at least) since the reason that was given for the war was that Sadam Hussein represented a clear and present danger to world security. The United States and its allies had to assure themselves that the threat was eliminated before he (Hussein) could commit another aggression. The decision to launch a preemptive attack was a necessity because nothing in the actions of the Hussein regime indicated a pacifistic stance. All the different elements that compose tacit communication indicated a high probability of aggressive acts, the reputation of the Hussein regime being what it was (war with Iran, massacres of the Kurd minority and the Kuwait invasion)[53].

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[52] Schelling (1960c)

[53] The discussion of the Second Gulf War does not reflect the opinion of the author in any way and is simply intended for purposes of illustration.

One can also use tacit communication to analyze the "open-skies" policy. In 1955, President Eisenhower proposed this policy to the Soviet Union government. It was original in that it did not consider the possession of arms as being provocative as long as they were "held in reserve". Thus arms possession is compatible with deterrence. Not only is it compatible but weapons are an important part of deterrence. Tacit communication was present, "(...), it can be more important to see that the enemy is not guessing about our intentions toward initiating surprise attack."[54] One must leave as little room as possible for interpretation; by doing this the enemy is not tempted to attack in self-defense. Under these circumstances, the notion of self-defense becomes a little bit tricky. If one's enemy feels sure he is being attacked, he will preempt the attack himself by attacking first. If one knows that his enemy is sure of being attacked, one will attack, so as to preempt the enemy's preemptive attack, and so on. Since the stakes are so high, one must assure oneself that this does not happen. Thus deterrence takes on a whole new importance.

The "open skies" policy relied heavily on tacit communication. Its motive was to communicate the message that the U.S. did not have first-strike capability but only counter-attack capability. The enemy had to be assured that he would not be attacked. Thus the underlying reason for such a policy was that maybe there were some capabilities one preferred not to have; "(...) there are not only secrets we prefer not to keep, but even military capabilities we might prefer not to have."[55]

So far, we have seen that stability is an important factor in Schelling's conception of the Theory of Conflict; we have also seen that to achieve this stability one has to rely heavily on tacit communication.

Now, let us turn our attention to the other economist that worked on conflict theory at that time, Daniel Ellsberg. We begin with a short biographical note that will help better understand his impact on the theory.

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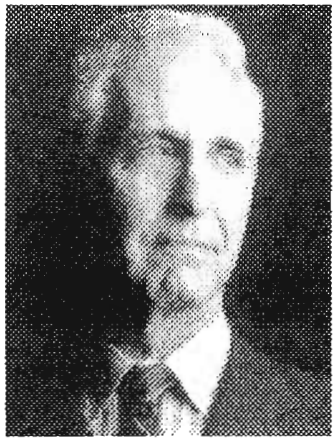
[54] Schelling (1959), p. 413
[55] Ibid, p.414

CHAPTER II

DANIEL ELLSBERG



Daniel Ellsberg was born in 1931 in Chicago, Illinois. In 1946, when Ellsberg was 15, he lost his mother and sister to a car accident in which he also broke his leg. His father was the driver; the family was coming back from Fourth of July celebrations. While reminiscing about this chapter of his life, Ellsberg remembers having a strange thought. While looking at the wreckage and knowing what had just happened to his mother and sister, he thought "Now I don't have to be a pianist anymore."[56]

Ellsberg went on to study economics at Harvard University (on a Pepsi-Cola Co. scholarship) between 1949 and 1952. Ellsberg was, by his own accord, a Cold War liberal: he admired Franklin Roosevelt and Harry Truman. Labor economics was his first love, or at least this is where his love for the field of economics came from, but, early on, he became fascinated with the field of decision theory: the abstract analysis of decision making under uncertainty. It was in this field that he would eventually have a lasting impact. Ellsberg went to Cambridge on a Woodrow Wilson fellowship for graduate studies. He then undertook military training in the Marine Corps, because he thought it was his responsibility to do so, "(...) when I returned from England, I thought it was time to do my duty."[57] He returned to Harvard in 1957 to complete his PhD in decision theory. The time he spent with the Marines (3 years) left him with "(...) a respect for the military, an interest in strategy, and a greater readiness to apply intellectual concepts to military problems than I would have felt otherwise". His academic interests had obvious applications to problems related with military strategy (as did Schelling's). He then applied for and received an invitation from

[56] Lukas (1971)
[57] Ellsberg (2002), p.25

the Economics Department of the RAND Corporation, in Santa Monica, California, "(...) with a sense of privilege and dedication, despite my intense personal aversion to nuclear weapons"[58]. This rapidly led on to bigger and better things.

When only 28 years of age, between March 10th and March 31st, 1959, Ellsberg was invited to give a series of lectures at Harvard, in the Lowell Lectures series, under the rubric "*The Art of Coercion: A Study of Threats in Economic Conflict and War*". Two of the lectures were given in Henry Kissinger's seminar on international relations. These were entitled "The Theory and Practice of Blackmail" (given on March 10th, 1959) and "The Political Uses of Madness" (given on March 26th, 1959). They were an analysis of Hitler's coercive diplomacy against Austria and Czechoslovakia in 1937: an attempt at formalizing the use of blackmail. These lectures prompted Schelling's admiration and caused him to affirm that, "Progress is being made"[59] (in the field of conflict theory). More than a decade later, Kissinger was to say that these lectures had provided him with a conceptual model of how to deal with Vietnam and bargaining in general (to Ellsberg's later dismay!).

From the summer of 1959, he became a permanent employee at RAND and chose to specialize in an issue which he had come to believe to be crucial to the avoidance of nuclear war: "the command and control of nuclear retaliatory forces by senior military officers and especially by the president". In order for him to work on this issue, he was provided a great deal of access to strategic military information including "knowledge of some of the most highly protected and closely held secrets in our military structure. These included military plans for general nuclear war that were generally inaccessible even to the highest civilian authorities."[60]

This knowledge included the top secret estimate by the Joint Chiefs of Staff that, in the event of general nuclear war with the Communist bloc, American nuclear weapons were expected to kill five to six hundred million people, most of them in the first few days. He was stunned;

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[58] Ellsberg (2002), p. 31
[59] Schelling (1960a), p. 13, ff
[60] Ibid, p. 37

> "A hundred Holocausts (...) It was the Joint Chiefs of Staff's best estimate of the actual results, in terms of human fatalities, of our setting into motion the existing machinery for implanting the current operational plans of the Joint Chiefs of Staff for general war (...) I still remember holding that graph in my hand and looking at it in an office of the White House annex in the Executive Office Bureau on a spring day in 1961. I was thinking: This piece of paper, what this piece of paper represents, should not exist. It should never in the course of human history have come to exist."[61]

In order to have access to the documents mentioned above, Ellsberg had to work in the Pentagon. His presence in the U.S. capital allowed him to become a consultant for the Department of Defense and the White House.

Ellsberg stopped working for RAND in 1964 to join the Department of Defense as Special Assistant to Assistant Secretary of Defense John McNaughton (who was Schelling's protégé[62]). McNaughton's sole responsibility at the time was the Vietnam conflict. Ellsberg then transferred to the State Department in 1965 in order to spend the next two years at the the U.S. Embassy in Saigon. On his return from Vietnam, Ellsberg rejoined the RAND Corporation. It was during this time that Ellsberg worked on McNamara's Top Secret *U.S. Decision Making in Vietnam, 1945-1968,* which would later become the *Pentagon Papers*.

Daniel Ellsberg leaked more top secret documents into the public domain than anyone else before Vasili Mitrokhin brought the KGB's secret archives to the West. Ellsberg revealed the secrets of the Pentagon and the White House in relation to the war in Vietnam – the *Pentagon Papers* as they became known. These are regarded as having precipitated both the end of Congressional support for the war (thus the end of the Vietnam War) and the downfall of President Nixon.

In order to better comprehend Ellsberg's interest and contribution to conflict theory, we must understand the origins of his dissatisfaction towards game theory. The following section will analyze Ellsberg's dissatisfaction with the minimax theorem.

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[61] Ellsberg (2002), p. 121

[62] There will be further analysis of the impacts of the relationship between Schelling and McNaughton

2.1 Daniel Ellsberg and the origins of conflict theory

Unlike Schelling's, Ellsberg's dissatisfaction with game theory was not aimed at John Nash; it was aimed at von Neumann and Morgenstern. More precisely, he was dissatisfied with their use of the rationality concept under uncertainty. He also criticized their use of the fictitious player device for the transformation of non-zero-sum games into zero-sum games as that gave way to imprecise solutions in the "Theory of the Reluctant Duelist", published in 1956. Ellsberg first asked the question "Is it useful to call a player irrational because he decides to use a non-minimax strategy?"[63]. This article lays the basis for all his later work in decision theory and especially for the work that is of particular interest to us, in the Theory of Conflict. Ellsberg's treatment of the question of rationality under uncertainty, solution concepts and the use of apparent irrationality was quite novel and can be directly linked to conflict theory. Ellsberg was immediately noticed for his work.

To better understand Ellsberg's work, here is a very brief discussion of von Neumann and Morgenstern's work and the minimax theorem.

2.2 Von Neumann and Morgenstern's work and the minimax theorem

In the *Theory of Games and Economic Behavior*, first published in 1944[64], von Neumann and Morgenstern set out to develop "(...) a theory of rational behavior in a social exchange economy"[65].

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[63] Ellsberg (1956)

[64] For a better understanding of the context which brought Von Neumann and Morgenstern to work on such a problem, see Leonard (1995)

[65] Von Neumann and Morgenstern (1953), p.31

Thus, von Neumann and Morgenstern were concerned with the analysis of the behavior of individuals, and the coalitions which they may be tempted to form in order to better their positions and utility level. One of the most important achievements of von Neumann and Morgenstern was the solution concept called the stable set. This solution is first described in section (4.1.2) of *Theory of Games and Economic Behavior*, "The immediate concept of a solution is plausibly a set of rules for each participant which tell him how to behave in every situation which may conceivably arise"[66]. Von Neumann and Morgenstern continue by saying, "(...) the complicated catalogue – which we expect from a solution- permits a very brief and significant summarization of how much the participant under consideration can get if he behaves rationally."[67] The authors admit that there is a chance that a solution could not be very precise since they refer to it as a "complicated catalog". This lack of precision was criticized by Ellsberg, though he was not the only one. One can refer to Carl Kaysen's review of the *Theory of Games and Economic Behavior* (Kaysen, 1948), to see that this was troublesome for him also. On the other hand, the authors say that it is done deliberately so as to include moves that could be considered as irrational by the other players, "(...) including those where 'the others' behave irrationally, (...)"[68]. They then proceed to extend the definition of their solution concept to all participants simultaneously:

> "Consider these amounts which the several participants 'obtain'. If the solution did nothing more in the quantitative sense than specify these amounts, then it would coincide with the well known concept of an imputation: it would just state how the total proceeds are to be distributed among the participants."[69]

The authors point out that, in many situations, there is no single imputation (which is simply a set of numbers showing the distribution of the total gain among the players), though it must be clear that a solution, or a stable-set, is a sub-set of all the possible imputations. Some situations (or games) have many stable sets (thus, the impreciseness). The stable set that will eventually be chosen by the player will heavily be influenced by what the authors call the bargaining powers of the players and the standards of behavior (which will be treated later

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[66] Von Neumann and Morgenstern (1953), p. 31
[67] Ibid, p. 33
[68] Ibid. p. 32
[69] Ibid, p. 34

on) in a society. The notion of "bargaining powers" draws criticism from Kaysen (as well as Ellsberg) and again in his review he wrote;

> "This reference to 'bargaining powers' is just an indication of the nature of the forces which determine the parameter. A complete theory would specify in detail these forces and their weights, thus leading to a single price (or perhaps a probability distribution of prices as the solution)."[70]

In order to build the stable set, the authors of the *Theory of Games and Economic Behavior* introduce the notion of *domination*. An imputation is said to be dominant if the players that choose this imputation are better off than if they chose another strategy, which is said to be dominated. Von Neumann and Morgenstern described the relationship of dominance of one imputation over another, as the following;

> "Assume that society, i.e. the totality of all participants, has to consider the question whether or not to 'accept' a static settlement of all questions of distribution by the imputation y. Assume furthermore that at this moment the alternative settlement by the imputation x is also considered. Then this alternative x will suffice to exclude acceptance of y. By this we mean that a sufficient number of participants prefer in their own interest x to y, and are convinced or can be convinced of the possibility of obtaining advantages of x."[71]

Thus x dominates y, since a player or a coalition cannot, if he or it is to be considered rational, choose y over x.

The notion of *dominance* allows von Neumann and Morgenstern to give what they call a "precise definition of a solution" (it is the title of section 4.5 of *Theory of Games and Economic Behavior*). A solution must have two properties, the first is in reference to what could be called "internal" stability, the relationship of an imputation to other imputations in the stable set. The second property is in reference to "external" stability: the relationship of imputations of the stable set to imputation that are not included in the stable set. Or, as the authors say; "A set S of elements (imputations) is a solution when it has the following two properties:

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[70] Kaysen (1946)

[71] Von Neumann and Morgenstern (1953), p.37

(4:A:a) No y contained in *S* is dominated by an x contained in *S*

(4:A:b) Every y not contained in *S* is dominated by some x contained in *S*"[72]

The authors go on to say that the two properties can be merged into one which is: "The elements of S are precisely those elements which are undominated by the elements of S"[73]. As one can notice, the authors may have titled section 4.5 "The Precise Definition of a Solution", it does not mean the number of possible outcomes is not very great. As stated before, it is the number of outcomes that has been criticized.

What von Neumann and Morgenstern thought could help illustrate the stable sets is a notion they called "accepted standards of behavior". The idea behind these standards of behavior was that certain solutions would be rejected on the basis that they would be thought as immoral or unsporting by the participants of the game. As von Neumann and Morgenstern say, "Indeed, it appears that the sets of imputations *S* which we are considering correspond to the 'standards of behavior' connected with a social organization"[74]. One must keep in mind that von Neumann and Morgenstern are looking for a theory that will explain social behavior. But one can still ask: "what do standards of behavior really mean?" It seems to mean that in reality any stable set might be accepted by some society if the people in that society could develop explanations for why it was the right way to behave, thus developing rules and norms to ensure that people behave accordingly. The following game, used by von Neumann and Morgenstern, will help illustrate the concept of 'standards of behavior'. It will also help illustrate the notion of 'bargaining abilities'. "Each player, by a personal move, chooses the number of one of the two other players. Each one makes his choice uninformed about the choices of the two other players."[75] The following matrix represents the payoffs of the players[76]:

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[72] Von Neumann and Morgenstern (1953), p. 40
[73] Ibid, p. 40
[74] Ibid, p.41
[75] Ibid, p. 222
[76] Ibid, p. 261

		Player		
		1	2	3
Coalition	1,2	0,5	0,5	-1
	1,3	0,5	-1	0,5
	2,3	-1	0,5	0,5

Figure 2: Von Neumann and Morgenstern example of a three player zero-sum game

If two players choose each other's number they will receive one half unit each, while the player who is excluded loses one unit. Such a game has one stable set that permits three possible imputations and as von Neumann and Morgenstern write, "Which of these three possible coalitions will form is beyond the scope of the theory, - at least at the present stage (...)"[77] What the authors mean by "at least at the present stage" is they have yet to present the notion of 'standards of behavior'. By introducing the notion, the authors wish to better describe the formation of coalitions in society.

In effect, one of the stable sets to a slightly different game from the one mentioned above, a game where communication between the players would be permitted, is self evident. 2 players form a coalition in order to "squeeze" one of the players out. If, for example player 2 and 3 decided to form a coalition in order to, as von Neumann and Morgenstern call it, discriminate against player 1, they would receive 0,5 unit each and player 1 would lose 1 unit. Now, in a more general game, or in society, if two players form a coalition and discriminate against another player, the amount the coalition would assign to the discriminated player would become the standard of behavior.

So, the standard of behavior refers not so much to the formation of a coalition as to the amount such a coalition can appropriate for itself (or, which comes to the same thing, the amount it must leave to the excluded player). The distribution, between the two discriminating players, of the amount they assigned to the discriminated player depends on what von Neumann and Morgenstern call "(...) their bargaining abilities (...)"[78].

[77] Von Neumann and Morgenstern (1953), p. 225
[78] Ibid, p. 289

Having examined what a solution consists of, we must look at how one arrives at the different imputations that compose the solution. In order to identify the possible imputations one must assume players use a minimax strategy, "(...) the minimax theorem- without which no theory of games can be said to exist."[79]

As has just been mentioned, the starting point of the mathematical theory of games is the situation in which the outcome of the game is determined by the strategies employed by the players. Each player in a game will try to maximize his or her gains and minimize his or her losses. The minimax theorem states that for every two-person zero-sum game, a mixed strategy exists for each player such that the expected payoff of both is the same value V when players use these strategies. Furthermore, V is the best payoff each player could expect to receive from playing the game; hence these mixed strategies are the optimal strategies for the two players to employ. Ellsberg's dissatisfaction lies in the use of the theorem by von Neumann and Morgenstern.

Firstly, in order to better understand Ellsberg's critique of the minimax theorem, we must examine Ellsberg's critique of von Neumann and Morgenstern's way of finding a solution to situations that involve uncertainty. In effect, what von Neumann and Morgenstern propose in a situation where information is not perfect, is the use of the minimax strategy. In order to prove this they use a situation that involves two games. They name Γ a game where information is not perfect;

> "The difficulty in analyzing Γ is clearly that the player 1, in choosing τ_1 does not know what choice τ_2 of the player 2 he is going to face and vice versa. Let us therefore compare Γ with other games where this difficulty does not arise"[80]

Von Neumann and Morgenstern go on to say that;

> "The introduction of these two games τ_1 and τ_2 achieves this: It ought to be evident by common sense – and we shall also establish it by an exact discussion – that for τ_1

[79] Luce and Raiffa (1957), p.2
[80] Von Neumann and Morgenstern (1953), p.100

> and τ_2 the best way of playing – i.e. the concept of rational behavior – has clear meaning."[81]

The two games (τ_1 and τ_2) are called the minorant and the majorant games. In the first game, the majorant game, player 1 must choose first, player 2 then chooses in full knowledge of what player 1 has done. In effect, since player 1 is known to be rational, the uncertainty aspect of the game is evacuated. Player 2 will choose the minimum element contained in the strategy player 1 will have chosen. This allows Ellsberg to say that player 1 should choose the "(...) maximin strategy corresponding to the largest row of minima"[82]. In the second game, the majorant game, player 2 must choose before player 1. Again, since player 1 is known to be rational, the uncertainty aspect is evacuated. Thus, Ellsberg writes; "The only strategy which is rationally consistent with his belief (...) is his minimax strategy, (...) which guarantees him the best possible outcome"[83]. But for Ellsberg, this does not solve anything since what von Neumann and Morgenstern are essentially saying is that, in a game which involves uncertainty, "(...) each player should choose as though he were moving first in a minorant (or a majorant) game, and as if he were certain that his opponent were rational and informed"[84]. Thus, the players must use the minimax strategy as if they were in a situation of perfect information. This is unsatisfactory to Ellsberg since, "Uncertainty is a state of mind, a property of belief or expectation; if it is present it cannot simply be 'assumed away'."[85] In such a situation, according to Ellsberg, the minimax strategy is but one of the possible strategies one could use when faced with uncertainty. This is the root of Ellsberg's critique; the players could and would use different strategies. Thus the minimax cannot precisely predict, or explain the behavior of a player in a situation where there is uncertainty, "(...) other strategies may offer the possibility of dazzlingly superior outcomes, combined with minimum outcomes barely below the maximin."[86]

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[81] Von Neumann and Morgenstern (1953), p.100
[82] Ellsberg (1956)
[83] Ibid
[84] Ibid
[85] Ibid
[86] Ibid

Ellsberg admits that the minimax has its merits, "(...) the certainty of achieving an outcome which is at least better than the worst possible (i.e., the lowest element in the matrix)."[87] On the other hand, the solution concept that von Neumann and Morgenstern created pushes aside strategies that could offer better outcomes.

Accordingly, Ellsberg asks: "Is it useful to call a player irrational because he decides to use a non minimax strategy?" In order to answer this question, Ellsberg uses an example; considering the payoff matrix below, if both players were to use a minimax strategy, the payoff would be 0. This is also true if only one of the players was to use the minimax strategy

			B		
		B-1	B-2	B-3
	A-1	10	0	-10
A	A-2	0	0	0
	A-3	-10	0	10

Figure 3: Ellsberg example of a situation where the use of the minimax strategy is not necessarily rational

In effect, if player A was to choose a non minimax strategy, for example A-1, player B, assuming he was rational, would choose his minimax strategy which is B-2. Player A would then get exactly the same payoff he would have received had he acted rationally and played A-2. The same reasoning applies if player B chooses a non minimax strategy and the other player acts rationally. The payoff would again be 0. As Ellsberg says, "(...) there seems to be no convincing grounds for saying that these choices would be unreasonable."[88] Thus, Ellsberg shows that in this particular case, it is not irrational for a player to choose a non minimax strategy.

This brings Ellsberg to a subject that will later allow him to write his 1961 article "Risk, Ambiguity, and the Savage Axioms". According to von Neumann and Morgenstern, the

[87] Ellsberg (1956)
[88] Ibid

players' behavior should not be affected if the payoffs were linearly transformed. Ellsberg, on the other hand, contends that, in reality, players would probably not behave in the same way if they have 1$ at stake as opposed to 1000$. (This has become known as the Ellsberg Paradox and will be discussed in the next section.)

After showing that the non-use of the minimax strategy in uncertainty does not necessarily imply irrational behavior on the part of the players, Ellsberg applies himself to show that the minimax is not a satisfactory solution concept. The minimax strategy represents, for Ellsberg "(...) the psychology of a timid man pressed into a duel."[89] (Hence, the title of his 1956 article.) Were a player to use the minimax strategy in a game, he would essentially be taking a defensive stance. This prompts Ellsberg to ask; "When did 'rational' become synonymous with 'defensive'?"[90] A player, knowing that his counterpart will choose the strategy that implies the highest payoff, should choose a strategy that implies the smallest lost.

Ellsberg goes on to ask, "Just what does this 'solution' solve?"[91] Much of the work done on the theory of the two-person zero-sum game, up to the publication of this article, was related to the "numerical computation of von Neumann's saddlepoint solution."[92] One has the right to ask the question and Ellsberg's answer could be summed up this way: not much. In fact, the use of this solution concept reflects "(...), the psychology of a timid man pressed into a duel"[93] and that, "(...) it could not be reliable in predicting behavior in situations corresponding to the zero-sum two-person game; nor is it plausible that players should be advised to conform to it against their inclinations."[94].

Thus, Ellsberg voiced serious doubts towards the minimax theorem. He did not think that it reflected correctly what could be observed in reality. The next section discusses what is now known as the Ellsberg Paradox.

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[89] Ellsberg (1956)
[90] Ibid
[91] Ibid
[92] Ibid
[93] Ibid
[94] Ibid

2.3 The Ellsberg Paradox

Ellsberg raises what was later called the Ellsberg Paradox in his 1961 critique of the Savage Axioms, "Risk, Ambiguity and the Savage Axioms" and his subsequent thesis "Risk, Ambiguity and Decision" in 1962. The Savage Axioms consist of four postulates which are:

- P1: Complete ordering of gambles or "actions".
- P2: The choice between two actions must be unaffected by the value of payoffs corresponding to events for which both actions have the same payoffs (i.e., by the value of payoffs in a constant column).
- P3: Corresponding to "admissibility", the rejection of dominated actions (this particular postulate was considered as non-controversial by Ellsberg).
- P4: The independence of probabilities and payoffs.

These postulates are normative criteria and should be able to predict certain behavior in particular situations as well as "reflective behavior" in those particular situations. But what Ellsberg says is that they do not have predictive capability in situations where there is uncertainty. He proves this, with what is known as the three-color urn problem (it is often referred to as the Ellsberg Paradox[95]). This problem could be described as follows: Consider an urn containing 90 balls, 30 of which are known to be red. The remaining balls are black and yellow balls in some unknown proportion. The following figures describe a pair of decision problems each involving a choice between two options. A ball is drawn from the urn and the player gets 100$ or 0$, depending on the color of the ball drawn and the option the subject has chosen.

[95] Ellsberg does not think of it as a paradox but simply as a counter-example.

	30	60	
	Red	Black	Yellow
Option 1	100 $	0 $	0 $
Option 2	0 $	100 $	0 $

	30	60	
	Red	Black	Yellow
Option 3	100 $	0 $	100 $
Option 4	0 $	100 $	100 $

Figure 4: Illustration of the Ellsberg Paradox [96]

Ellsberg asks his readers to choose which of the preceding options they prefer. He claims that if the reader favors option 1 over option 2 and option 4 over option 3, he is normal since that is the behavior most people choose. Since the probabilities and the payoffs are the same, he demonstrates that there is a readiness to violate P2, or what Ellsberg calls the Sure Thing Principle. Thus, the Savage Axioms are not universally applicable for predicting and analyzing behavior of all rational agents in situations involving uncertainty. Ellsberg suggests that modifications are needed to the expected utility model and also to the axioms. The Sure Thing Principle, or characteristics resembling it, resurface as postulates in the von Neumann and Morgenstern theory. In fact, Ellsberg suggests that one may wish to impose restrictions on the use of von Neumann-Morgenstern utility axioms. He recommends the use of what he calls the Restricted Bayes/Hurwicz Criterion for the resolution of these types of games,

> "In the last two chapters the following testable propositions have been advanced: (1) certain information states can be meaningfully identified as ambiguous; (2) in these states, many otherwise reasonable people tend to violate the Savage axioms with respect to certain choices; (3) their behavior is deliberate and not readily reversed upon reflection; (4) certain patterns of 'violating' behavior can be distinguished and described in terms of a specified decision rule; (5) this decision rule is one which has, in the past, been recommended or suggested as appropriate by reputable theorists; (6) many of the people concerned recognize the rule as reflecting the sort

[96] Adapted from Ellsberg (2001)

> of considerations that influence their behavior and the rough character of actual mental processes by which they arrive at their decisions."[97]

By saying that there is a wide variety of problems and thus a large range of possible answers for rational agents, Ellsberg says that his criterion is the only one that can manage to accommodate this large range of eventualities.

Please keep in mind that this critique (the harshest since the publication of *The Theory of Games and Economic Behavior* in 1944) comes from a 24 year old who has not even started his doctoral studies. Moreover, he would not continue to work on game theory until his return from the Marines, three years later.

It is contended that the time Ellsberg and Schelling spent at the RAND Corporation influenced them in applying there ideas to military situations. Thus, in order to better understand why Ellsberg and Schelling decided to apply their ideas to conflict situations, the following is a short discussion of the atmosphere that RAND helped create and also a short description of the think tank.

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[97] Ellsberg (2002), p. 219

CHAPTER III

THE RAND CORPORATION

RAND was created in 1946 in order to provide the US Army Air Force and its successor the US Air Force, with a research staff. In 1944, General Henry Harley (Hap) Arnold wrote a letter to Theodore von Karman (a Hungarian refugee), asking him to prepare a plan for the creation of a military research group in Santa Monica. Thirteen months later Karman and his Army Air Force Scientific Advisory Board had created a multivolume report called "*Toward New Horizons*" which, in fact represented RAND's birth certificate. RAND's charter reads: "Project RAND is a continuing program of scientific study and research on the broad subject of air warfare with the object of recommending to the Air Force preferred methods, techniques and instrumentalities for this purpose."[98] Kaplan's account of RAND's atmosphere is very suggestive as regards the influence that the corporation could have had on Schelling and Ellsberg,

> "Isolated from the hurly burly of the rest of the world, the men and women (mostly men) of RAND nurtured an esprit de corps, a sense of mission, an air of self-confidence and self-importance. It was, in large measure, this atmosphere, this intoxication, that induced the gradual creation of a doctrine concerning nuclear weapons, nuclear deterrence, nuclear war-fighting; that identified this doctrine with RAND, (...)"[99]

It was in 1947 that *The Theory of Games and Economic Behavior*'s co-author, John von Neumann, entered RAND as a part-time consultant, continuing to work on military research, that had been started in 1937 and which was to last until his death. It has been argued that his presence heavily influenced the research that was done at RAND in favor of the Theory of Games (Leonard, 1994). RAND promoted an interdisciplinary approach to research. As a matter of fact, the staff consisted of people committed to natural (mainly physicists and

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[98] Kaplan (1983), p. 59
[99] Ibid, p. 51

engineers) and social sciences. Herman Kahn is one of the best examples since he came in to RAND as a physicist and left as an economist[100].

It is argued (Leonard, 1991) that the appointment of Charles Hitch as the head of RAND's new Economic Division in September of 1947, was the starting point of the emergence of economists within the corporation, "The affiliates Hitch assembled quickly made their presence felt among their colleagues (...) and, by 1960, RAND had become identified with systems analysis, a cost-benefit approach to conflict refined and implemented by economists."[101]. The emergence of economic thought was not unique to RAND, it was also being supported by Bernard Brodie who, in a 1949 article "Strategy as a Science" published in *World Politics* argues that, "The best hope for elaborating any theory of strategy, (...), lay (s) in exploring its parallels with 'the science of economics', which had 'enjoyed the most systematic' and development among social sciences."[102]

It is Albert Wohlstetter who best illustrates the impact of the emergence of economists within RAND. Working on the vulnerability of foreign bases to surprise attack, Wohlstetter and Harry Rowen had a very important impact on the U.S. Air Force strategy, "(...) the Air Force Council concurred with the need for a strategy shift and concluded that the RAND finding, for the most part, should be adopted."[103] Thus, "(...) RAND's system analysis (...) had caused a significant reorientation in Air Force thinking."[104] Such success paved the way for the advent of Robert McNamara and the Whiz Kids which is considered as the peak of the influence of economic analysis on defense policy.

Thus it was the prevailing atmosphere of the 1960's, with the advent of Robert McNamara and the Whiz Kids in the Pentagon, the work atmosphere at RAND where Schelling worked in 1958 and Ellsberg from 1959 to 1964 and 1967 to the early 1970's, as well as a

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[100] For further discussion on RAND's atmosphere and influence, one must refer to Kaplan (1983), Amadae (2003) or Leonard (1994) and (1995).
[101] Leonard (1991)
[102] Ibid
[103] Ibid
[104] Ibid

dissatisfaction with game theory that motivated Ellsberg and Schelling to create conflict theory.

As previously mentioned, both Ellsberg and Schelling publicly disavowed the government policy in the early 1970's. Ellsberg had first hand experience of the War since he was in Vietnam for three years not as a Marine, but while working at RAND. On his return from Vietnam, he wrote a series of papers on what was happening over there[105]. On the other hand, Schelling did not go to Vietnam; he stayed in the US where he had the ear of government officials. It was those same officials who decided to use Schelling's ideas on coercive warfare in order to intimidate the North-Vietnamese. His ideas on tacit bargaining were also put to use against the Viet-Cong. But it was to no avail; one of the reasons being that US officials thought their opposites were rational (driven by the utility level they provide). It could also be attributed to what Schelling later calls "personification"[106]. The U.S officials did not stop and think that bombs had no effect on them. The Viet-Cong, seeing the destruction cause by U.S. bombing, did not decide to lay down their weapons. The Vietnamese had successfully driven back foreign invaders for more then 400 years. They were not about to let the Americans be the first to succeed.

In order to understand why conflict theory had such an influence, one must understand what conflict theory consists of. In the next sections, there will be a discussion of the origins and the concepts that compose conflict theory.

[105] There will be further analysis of this series.
[106] The impacts of this will be treated later on.

CHAPTER IV

THE THEORY OF CONFLICT: THE CONCEPTS

In the first chapter of The Strategy of Conflict, entitled "The Retarded Science of International Strategy" (first published in the *Bulletin of the Atomic Scientist*, December 1959), which Schelling had presumably written while at RAND in 1958, Schelling says, that he is looking for behaviors during conflict (armed or not) that would allow the player to be viewed as victorious. "A study of conscious, intelligent, sophisticated conflict behavior – of successful behavior- is like a search for rules of « correct » behavior in a contest winning sense."[107] With that in mind Schelling could apply his ideas to a large range of situations. It could also be contended that he was trying to find ways of minimizing the cost and duration of conflicts.

In the second chapter, "An Essay on Bargaining" (first published in June 1956 in *The American Economic Review*) which was influenced by the time Schelling had spent negotiating the Marshall Plan, Schelling starts to dabble with negotiation. He had not yet been at RAND, nor presumably had he communicated with Ellsberg, since the latter was in the Marine Corps at the time. Ellsberg does admit that the article had a strong influence on his Lowell Lectures. Nonetheless, it is while working on this article that the idea of creating a new discipline first came to Schelling's mind. "An Essay on Bargaining" is centered on the distribution effects of negotiation where a better result for one of the parties implies a lesser one for the other, "This chapter presents a tactical approach to the analysis of bargaining"[108]. Each party is motivated by convictions and the only way to reach a solution is for a concession to be made by both, or at least one, of the parties. But why would any player behave this way? The logic behind the concessions is that it is better for both parties to find a solution. The difficulty lies in knowing which of the parties will have to make the concession. The comprehension of negotiation tactics is very useful in this,

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[107] Schelling (1960a), p. 3
[108] Ibid, p. 21

> "The purpose of this chapter is to call indeterminate situations. The essence of these tactics is some voluntary but irreversible sacrifice of freedom of choice. They rest on the paradox that the power to constrain an adversary may depend on the power to bind oneself"[109]

According to Schelling it is very useful to commit to something beforehand. This commitment gives one a greater negotiation power.

Contrary to common intuition, power, force and ability are not always an advantage in a negotiation. These qualities are not useful if the other party is hardheaded and is not aware of his own reputation or his adversary's reputation. The concepts of commitments and threats are central to Schelling and are an integral part of Schelling's conception of negotiation. Also, it is easier to prove something that is true than something that is not. How then, one can ask, can one change what is real? Schelling answers: "make it true"[110]. A way of making something true is by committing to a position. One of the parties in a negotiation pledges to perform some action or threatens to, a threat being very similar to a commitment since it implies pledging to inflict pain in the future. Both commitments and threats are intended to influence the party and cause him to modify his behavior. To illustrate this, Schelling gives the example of someone who is interested in buying a house that is for sale, "(...) if the buyer can accept an irrevocable commitment, in a way that is unambiguously visible to the seller, he can squeeze the range of indeterminacy down to the point most favorable to him."[111] Though, a commitment to a position only has an impact if the commitment that is taken is communicated and is plausible. In a world where commitments as well as their communication were easy, the advantage would always go to the one who could commit the fastest. One can easily see why the notion of non symmetry is so important for Schelling. As was said earlier, the symmetry axiom in the Nash bargaining solution did not permit any of the behaviors mentioned above.

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[109] Schelling (1960a), p. 22
[110] Ibid, p. 24
[111] Ibid, p. 24

4.1 Deterrence

Schelling goes on to the treatment of the question of deterrence which is described as "(...) the skillful nonuse of military forces (...)"[112] and the concept of threat is central to this notion. Deterrence is also very important for the Cold Warriors, since the United States. was afraid that the Soviet Union had a plan for world domination. To fully understand the concept of deterrence one has to be familiar with Schelling's definition of threats.

According to Schelling, there are two kinds of threats:

1) The kind of threat where the two parties have an interest in applying the threats in the advent of attack. The deterrence potential of these threats is not very high, since it is not their principal function.
2) The threats which none of the parties want to put into application. The principal function of these threats is deterrence by promising mutual destruction. In order to render this type of threat credible, a commitment has to be made. They imply that both sides are committed to total destruction if their position has reached a point of no return. In order for this strategy to be effective, one must possess sufficient credibility in the eyes of the opposing party. Practically, this level of credibility is often reached by putting one's own reputation at stake. This is very frequent in negotiations between unions and companies. This kind of threat forces the other party to make concessions to avoid mutual destruction, "When a person has lost the power to help himself, or the power to avert mutual damage, the other interested party has no choice but to assume the cost of responsibility."[113] The threatened party, also has options, it can commit an aggression before the threat is communicated, it can try to share the risk with a third party or it can try to misinform the other party of its payoffs.

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[112] Schelling (1960a), p. 9
[113] Ibid, p. 37

To maximize the credibility of the threat, it has to be clearly and definitively communicated to the other party. Also, it is preferable to break up a serious threat into smaller threats, "Similar to decomposing a threat into a series is stating a threat with a punitive act that grows in severity with the passage of time."[114]

It is not always easy or possible to verify if the other party has complied with a demand in order to avoid the posed threat. Schelling proposes to include a criterion that does not have to be directly linked to the ultimate goal, but the sole purpose of which would be the observance of compliance. This was a major problem during the Vietnam War and the negotiations with the Viet-Cong. Schelling was stumped to find an adequate answer, when asked by the government to find a criterion that the Viet-Cong could respect to show their willingness to negotiate.

4.2 Brinkmanship

There is also the very important notion of "brinkmanship". Schelling illustrates this notion as being on the edge of a cliff where the terrain is not very sure. One cannot exactly know where the cliff starts, but the more one approaches the edge, the greater the probability of falling down, "The brink is not in this view, the sharp edge of a cliff where one can stand firmly, look down and decide whether or not to take the plunge."[115] This notion relates also to the "Threat that Leaves Something to Chance" chapter since it is not sure when one will "take the plunge" as Schelling himself says. He also brings more precision to the notion of brinkmanship in his 1966 *Arms and Influence* by saying that it is similar to, "(...) manipulating the shared risk of war."[116]

The notion can best be illustrated by imagining a situation in which two climbers are tied to one another If one wants to intimidate the other, he can seemingly fall over the cliff, but he must also use uncertainty and irrationality for the threat to be credible. "If the brink is

[114] Schelling (1960a), p. 42
[115] Ibid, p. 199
[116] Schelling (1966), p. 99

clearly marked and provides a firm footing, no loose pebbles underfoot and no gusts of wind to catch one off guard, (...) neither can pose any risk to the other by approaching the brink."[117] As one can see, uncertainty is an important aspect of brinkmanship; one can create an air of uncertainty for a threat to be credible. Schelling illustrates how uncertainty can contribute to threats;

> "The question is really: is the U.S. likely to do something that is fraught with the danger of war, something that could lead - through a compounding of actions and reactions, of calculation and miscalculations, of alarms and false alarms, of commitments and challenges - to a major war?"

Thus, uncertainty and the notion of brinkmanship facilitate the use of commitment and threats by making them appear more credible.

The notion of threshold can also be associated with brinkmanship. Going towards the edge of the cliff means going through a threshold, such a situation also uses the notion of focal points. Schelling illustrates the notion of threshold by giving the example of a child to whom a parent says not to go swimming. The first thing one knows is that the child has both feet in the water. The parent can repeat what he said: that the child could not go swimming and the child will reply: "I'm not swimming." The child will wade further and further into the lake and finally start swimming, to the parent's dismay who will tell himself: "The child does not obey". What really happened is that the child by going into the water crossed a threshold. From that point on, it was difficult to stop the child from going swimming. Similar behavior can be extended to nations in conflict.

Another concept that the Theory of Conflict wishes to formalize is the use of threats; Ellsberg, not Schelling, worked on that part of conflict theory

[117] Schelling (1966), p. 99

4.3 The Theory of Conflict and the Practice of Blackmail

After spending some time in the economics department at RAND (Schelling was also there at the time), Ellsberg gave his 1958 Lowell Lectures. What he was trying to do was to formalize the use of blackmail. His formalization derives primarily from economic bargaining and also, by his own admission, from Schelling's "An Essay in Bargaining" which was very stimulating in this treatment of blackmail. Ellsberg is interested in the use of threats because, "(...) threats and ultimatums can lead to peaceful 'solutions' (...)"[118]. In effect, according to Ellsberg, threats can be used as a peacetime tool of diplomacy. Ellsberg also points out that a threat only has an influence on "rational behavior", since the subject's behavior is controlled by his expectations of outcomes and by his preferences. He is also quick to point out that, "A good deal of 'insane' behavior, in other words, might be 'rational' in this technical sense, (...)"[119]. This formalization will look to answer some basic questions such as[120]:

- What data is relevant to a 'blackmailer's' decisions?
- How are threats measured and represented?
- How do threats influence decision making?

Firstly, concerning the relevant data, this refers to the knowledge of the level or likelihood of a threat that is given by the subject. That is, how likely it is, in the subject's opinion, that, a threat will be put in application. To be effective, a threat does not need to be a certainty but simply, "sufficiently likely"[121]. A way to measure this level of likelihood, according to Ellsberg, is the odds that players give to gambles on the likelihood of certain situations. Concretely, what the blackmailer must do is: "(...) to ensure – by actions that either change your payoffs, hence your critical risk, or that increase your expectation of punishment – so that your estimate of the actual risk is greater then the critical risk."[122] For convenience

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[118] Ellsberg (1959)
[119] Ibid
[120] Ibid
[121] Ibid
[122] Ibid

sake, Ellsberg assumes that "(...) a player's state of uncertainty, his expectations, can be represented by a distribution of 'subjective probabilities'"[123] Realistically, one would evaluate the critical risk, or the threshold, as low, if the victim does not need to be very sure to do what the blackmailer requires. On the other hand if the threshold is high, the blackmailer must make the threat as probable as possible. The blackmailer will also want to influence the victim's estimates of his payoffs.

Secondly, Ellsberg represents threats in matrix form such as:

		Victim	
		Comply	Resist
Blackmailer	Accept	(100, 10)	(50, 100)
	Punish		(0, 0)

Figure 5: Ellsberg's representation of threats

The numbers to the right being the victim's payoff, the numbers to the left the blackmailer's payoff. Contrary to Luce and Raiffa, there is no basis for comparing the victim's and the blackmailer's payoffs and that is why there is no payoff for the combination of the Punish and Comply strategies.

The concept of probability of threats must not be confused with Schelling's idea of "The Threat that Leaves Something to Chance" since what Schelling develops in that chapter of *The Strategy of Conflict* is the notion that the threat is not completely under the threatener's control. There is a random ingredient to the application of the threat. Schelling's goal in that chapter was simply to state that an effective way of coercing someone was to include a random ingredient, whereas Ellsberg's goal is completely different since he wishes to formalize the systematic use of blackmail for coercion.

Thirdly, the available data influences the behavior of the subjects in many ways. Since the payoffs seem to have an influence on the victim's behavior, the higher the payoff associated with "Resist" behavior, the more credible the threat has to be. Ellsberg comes to this

[123] Ellsberg (1959)

conclusion with the analysis of a bank robbery where a man simply passes a typed note to a teller saying that he has two grenades and that the teller should put 5000$ in a coin bag. The teller does as he is told since he considers the threat likely enough. However, when the robber sees that there is much more money in the drawer, he asks for the rest of it. The teller simply tells him that 5000$ was all he had asked for and refuses to give the robber the remaining money. Thus the teller considers the threat as credible enough when 5000$ is at stake but not credible enough when a lot more is at stake. This contradicts Savage's fourth postulate, which states that there is independence between the probabilities and the payoffs. According to the Savage Axioms the teller's reaction should not have changed with the amount that was asked for

According to Ellsberg, there are four threat techniques that could, "(...) make it sufficiently plausible that he will carry out a costly threatened action."[124] Two of these techniques are similar to Schelling's, such as the commitment where, "(...) the blackmailer can voluntarily but irreversibly give up his freedom of choice"[125]; the other is where, "The player binds himself to incur certain costs or penalties or to forego certain advantages if he should fail to carry out a pledge."[126]. Ellsberg then points out that Schelling does not make a clear distinction between the two types of threats. These two types have drawbacks since, "(...) (who) would really bind himself irrevocably to carry out a suicidal punishment?"[127] (that is the hardest critique Ellsberg addresses to Schelling). According to Ellsberg, these threats are not optimal from the threatener's point of view and it is with this in mind that he proposes the other two techniques; one can make his actions unpredictable and/or make himself appear irrational. There will be a subsequent discussion of these techniques in the next sections.

What this analysis brought to conflict theory is easily seen since one of the ways of making a situation turn in one's favor is by using threats. Also Schelling explicitly said that conflict theory implied the use of threats.

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[124] Ellsberg (1959)
[125] Ibid
[126] Ibid
[127] Ibid

4.4 The Theory of Conflict and Political use of Madness[128]

It is interesting to note that Ellsberg refers to the use of madness - that is irrational behavior - simply to confuse the opponent in his 1956 article: "Creating doubts by deliberately erratic or 'foolish' choices, one could tempt the opponent to pursue (for sound, profit-seeking motives) into the regions where big killings were possible."[129] Less then 3 years later, Ellsberg would give his crucial (at least in Schelling's eyes) lectures on the Art of Coercion at the Lowell Institute. In one of these lectures he tried to show that Hitler deliberately made sure that his enemies (or adversaries) knew and were sure that there was not a threat he would not put to execution. Hitler wanted to be assured that his adversaries thought he was unpredictable.

At one point, Ellsberg analyzes the invasion of Czechoslovakia. What Hitler did was to put the fate of the Czechoslovakians in the hands of their President, Dr Emil Hàcha. Hitler requested a personal audience with President Hàcha[130] -- keep in mind that the Anchluss with Austria had already been carried out. At this point, Hitler said that it was up to Hàcha and his Foreign Minister, Chvalkovsky, to decide if there would be blood spilled over this matter. Hitler said that the invasion of what was left of Czechoslovakia by the German army was set in less than 5 hours. He also let the two gentlemen know that the orders had already been given and that if Hàcha decided to give the order to resist the invasion, the German army was ready to fight and would prevail[131]. Therefore, since there was no way of stopping the invasion, it would be better that Hàcha give the order not to resist. That way, the invasion would be imposed without bloodshed.

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[128] My treatment of this particular point is highly inadequate; the reason being that access to Ellsberg's Lowell Lectures is difficult.
[129] Ellsberg (1956)
[130] There is a difference of opinion on this point. Some historians have contended that the Germans forced Hàcha to come to Berlin. (Shirer (1960), p. 443)
[131] This is also seen as highly optimistic on Hitler's part, according to some historians (Shirer (1960)).

The truth was that Hitler could ill afford to have an armed resistance to his Czechoslovakian invasion since the resistance would act as an alarm bell or as a plate-glass window[132] and alert England and France to what he was doing.

What Ellsberg is trying to do, and the reason why Schelling refers to his lectures, is to illustrate the use of commitments and deterrence by Hitler in negotiations. The fact that Hitler told Hàcha that the invasion orders had been given is equivalent to making a final offer and leaving the room. As Schelling says, one has to make "(...) the other player choose in his favor"[133]. Also, the threat will cause losses to both sides, though the losses would not be symmetrical. What is more, as we have seen before, the deterrence potential of this kind of threat is high.

How economists came to have such an influence on U.S. military decision making can be explained, in part, by RAND's influence (which has been discussed in Chapter 3). It can also be explained by the presence of the Whiz Kids in the Pentagon. Though, why the Theory of Conflict ideas had such influence cannot solely be explained by what has been said. The following is an explanation of how the Theory of Conflict came to have such an influence during the 1960's and how this influence was felt.

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[132] Schelling also uses the plate-glass window analogy. The breaking of a plate-glass window is hardly a discrete affair and would surely attract unwanted attention. He also sees the plate-glass window as a trip wire.

[133] Schelling (1960), p.276

CHAPTER V

THE THEORY OF CONFLICT AND U.S. FOREIGN POLICY

How Schelling's ideas received so much attention may be explained this way: during his stay at Harvard, Schelling met John McNaughton. Within a short period of time McNaughton became Schelling's protégé. An important intellectual bond was created between the two men.

> "(one) of the Pentagon's brightest theorists and most skillful bureaucratic players, happened to be one of Tom Schelling's most dedicated devotees, a Harvard Law School professor named John McNaughton."[134]

It is because of McNaughton and the publication of *The Strategy of Conflict*, that Schelling won McNamara's ear. This allowed conflict theory to have an influence on U.S. foreign policy early in the 1960's. How McNaughton got to be McNamara's assistant was in part because of Schelling. In effect, McNamara was looking for a special assistant on arms control. McNamara had offered the job to Schelling, who refused but recommended McNaughton. The latter, after learning that his mentor had recommended him, went to see Schelling, telling him that he was interested in the job, but did not know the first thing about arms control. Schelling told him not to worry; he would show him everything there was to know about the subject. McNaughton later became General Counsel of the Department of Defense[135].

An example of Schelling's influence over McNaughton can be seen in a speech that the latter gave in 1962:

> "The open declaration of a city-avoidance option (as compared with a mere secret preparation for city avoidance) is, in a sense, a notice served. It is a notice in accordance with which an enemy may well expect the United States to behave in case war is forced upon us. (...) If it (the enemy) values the lives of its citizens, it

[134] Kaplan (1983), p. 332
[135] Ibid, p. 332

> should take steps to create for itself a targeting option to spare the cities of its enemies."[136]

Notice the influence of Schelling, especially in tacit bargaining and making the enemy behave in a way that is non-threatening. These two characteristics are very important to Schelling and central to conflict theory. This is achieved by the open declaration of city-avoidance and by adding emphasis on the fact that the enemy will do the same if it "values the lives of its citizens". This is known as the "no-cities strategy". There will later be treatment of the subject.

The modus operandi that was in place at the end of the 1950's for the use of nuclear weapons was Eisenhower's. It preached full out attack, or "all or nothing" as it became to be known. Eisenhower believed that the U.S. could win a nuclear war against the communists, so he preached that in the event of a hostile act by the Soviets, the U.S. response should be an all out nuclear attack. McNamara[137] for his part, also believed in the U.S.'s chances of winning a nuclear conflict, but he did not see the point of winning if the win came at the cost of a 100 million lives and 30 years of economic depression. He was not satisfied either with the flexibility that would be allowed by the Eisenhower strategy, or the lack thereof. At that time McNamara, Kissinger and Schelling were all looking for a modus operandi that allowed for more flexibility, one that would not automatically lead to a nuclear war. Kissinger[138] thought it possible to win a limited nuclear war with the Soviet Union; but could the U.S. realistically foresee a strategy that would result in 25 million lives instead of 50 or 100 and 10 years instead of 30 years of economic depression?

In the 8th chapter of *The Strategy of Conflict* "The Threat that Leaves Something to Chance", Schelling puts forth the argument that sets him apart from Kissinger and others. This argument heavily influenced McNamara and his associates. This influence can be seen

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[136] John T. McNaughton, General Counsel of the Department of Defense, address to the *International Arms Control Symposium*, December 1962 in Schelling (1966)

[137] One can refer to the Errol Moris's film, *The Fog of War*, to have a better idea of McNamara's thoughts on nuclear warfare.

[138] See Kissinger (1969), but he had been trying to influence U.S. foreign policy since the early 1960's.

in a speech McNamara gave in June of 1962. The Secretary of Defense laid out a new defense strategy that was said to be flexible. McNamara was known for his preference for strategies with "multiple-solutions" (this could maybe be explained by the fact that he was an economist). This new strategy, which is now known as the "counterforce strategy" and the "no-cities strategy", is in fact two distinct strategies (this is a source of ambiguity that troubled Schelling). McNamara's strategy puts forth the idea that, in the event of a war between the two super-powers, destruction would not be total. Deterrence should continue and the parties should always keep their options open. In effect, the parties must be able to put an end to the hostilities before the respective arms stockpiles are reduced to nothing. Hence the importance of arms control. It was innovative since it put forth the idea of using deterrence during a conflict. Former policies used deterrence but always before a conflict started, in order to minimize the probability of a conflict. McNamara wanted to use deterrence and tacit bargaining in order to put an end to a conflict.

Counterforce is the first of the two elements that composed the new McNamara strategy, and is the one that attracted the most attention. It suggested that the primary targets be the weapons the adversary is capable of using when attacking. Given that he can no longer use these weapons to defend himself or to attack, the adversary will have no choice but to surrender. This train of thought can be associated with H. Kahn who first exposed these ideas in his book, *On Thermonuclear War*. The other side of McNamara's strategy is better known as the "no-cities strategy". It put forth the idea of taking the enemy cities as hostages. This strategy relies on tacit bargaining and deterrence. The aim is to communicate to the other party that one is able to completely destroy the other party's territory or at least a big part of it. Schelling's influence is felt in the reserve force, as well as in the idea of finding ways out of a conflict (before entering one), both of which were components of McNamara's strategy.

In 1965[139], Schelling published "Controlled Response and Strategic Warfare" in the *Adelphi Papers*. In this article, Schelling wishes to distance himself from McNamara's strategy,

[139] One can only conjecture as to the reasons why it took so long for Schelling to react.

since, in Schelling's opinion, counterforce and no-cities seem, at first glance, to be mutually exclusive but are not quite that and can create unneeded confusion.

Firstly, Schelling says that none of these strategies can be applied if the parties are not rational. Here and in many other published works, Schelling feels the need to support rationality. Schelling does not seriously tackle the issue; he simply brushes it aside by simply stating the obvious. He does not explain why, or how, one of the parties (or both) could act in a manner that could be qualified as irrational. This is also strange since one can assume that Schelling knew about Herbert Simon's work on bounded rationality, especially since Simon's 1955 "A Behavioral Model of Rational Choice" article is one of the most cited works by game theorists working on or with rationality. One can also assume that Schelling was familiar with Simon's article since it was written (at least the first draft) at RAND. Simon's goal in his 1955 article is;

> "(...) to replace the global rationality of the economic man with a kind of rational behavior that is compatible with the access to information and the computational capacities that are actually possessed by organisms, including man, in the kinds of environments in which such organism exits."[140]

Simon pays close attention to the limit a "choosing organism" can process in order to take a "rational" decision. As Simon says;

> "(...) actual human rationality-striving can at best be an extremely crude and simplified approximation to the kind of global rationality that is implied, for example, by game-theoretical models."[141]

One can refer to E.-M. Sent's work for further information on Herbert Simon. A reason that might explain why Schelling does not refer to Simon's work could be that, even if Simon was very enthusiastic towards game theory in 1945, he became more and more dissatisfied with it as time went on. In 1958, Simon was quite dissatisfied with game theory notably with the "(...) achievement of a really satisfactory definition of 'solution' for non-zero-sum

[140] Simon (1955)
[141] Ibid

and n-person games seems even farther off now than it did a decade ago..."[142]. He also "(...) criticized von Neumann and Morgenstern's theory of coalitions, faulted their definition of good strategy, and questioned their solution concept."[143] Schelling never really formally criticized von Neumann and Morgenstern. He had, as has already been said, voiced criticism of the Nash solution, though this does not explain why he felt the need to support rationality.

Later in his life, Schelling puts this problem aside by saying that one should anticipate his own irrational actions, a rational decision (or action) being a decision (or action) that maximizes (or at least increases) one utility level. He illustrates this by giving the example of an ex-smoker who has just quit smoking. A friend comes over to have a cup of coffee and, when leaving, forgets his cigarettes. The ex-smoker puts his friend's cigarettes in his pocket, thinking he will give them back to his friend the following day; 15 minutes later the ex-smoker flushes the cigarettes down a toilet. "What provoked this irrational action?" Schelling then asks. His answer is that, the ex-smoker understood that he had just passed a threshold that could lead to him having a cigarette. He anticipated his own irrational action[144]. Schelling also comes to the conclusion that the rational choice model is at best a very simplified way of explaining and predicting actual human behavior.

Secondly, the problem with McNamara's strategy, according to Schelling, is that it is in fact two strategies. The counterforce strategy states that one must destroy the enemy's weapons before they are used. The problem with this strategy, Schelling says, is the state of confusion it creates, "The counterforce campaign would be noisy, likely to disrupt the enemy command structure, and somewhat ambiguous in its target selection as far as the enemy could see."[145] One can see why the general mood created by the counterforce is not wanted in time of conflict, whereas, the other side of McNamara's strategy, the no-cities strategy states that the U.S. must create a situation where the enemy should not attack, even if it has the capacity of doing so. It also has the merit of being seen as a way to minimize the probability of there being a conflict, "It can also, with no loss of manliness, be recognized as

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[142] In Sent (2004)
[143] Sent (2004)
[144] In Schelling (2001) (translation by the author)
[145] Schelling (1965)

a decent effort to keep from killing tens of millions of people whose guilt, if any, is hardly commensurate with their obliteration."[146] This strategy takes the form of a negotiation (with tacit-bargaining). If nuclear conflict there is, then great loss of life there will be and nobody will be able to claim victory, "(...) historians would not much care whether the Soviet cities were destroyed by weapons produced domestically or abroad."[147]

Schelling also states that the evaluation of these strategies should be done on the basis of technology, costs, and paying capacity, as did McNamara[148] and as was dictated by operational research. There can be several situations where the use of one strategy or the other (counterforce and no-cities) can have very different impacts. Schelling did not want to say which of the strategies should be used (even though, after reading the article and knowing his background, one can easily know which strategy Schelling is in favor of) but to distinguish the two strategies. Given that one of the strategies uses notions that he put forth and used many times, he felt compelled to clarify the difference between the two. The counterforce strategy requires speed from an adversary and can create unwanted confusion and chaos. These two characteristics are to be minimized at all costs. The type of weapons that the parties must favor in counterforce can contribute to unstable situations. If one of the parties favors counterforce, it will equip its armed forces in a way that will permit it to destroy the other party's weapons. The other party seeing this will have a greater chance of striking first. If the emphasis is given to counterforce, there will be a greater chance of a preemptive strike, since the advantage given to the party that strikes first is great, thus the unstable situation.

The no-cities strategy on the other hand puts the emphasis on what could be called dirty weapons (contrary to counterforce, which puts the emphasis on clean weapons) that have the capacity of causing a great number of casualties. This strategy, as contradictory as it may sound, is more stable (refer to Wohlstetter's image of a Balance of Terror). This stability is produced by the fact that neither of the parties wants to initiate a conflict. This information is known to both parties (common knowledge); also known is that they both have second

[146] Schelling (1965)
[147] Ibid
[148] See Amadae (2003)

strike capacity. Both are aware of the living conditions that would prevail in their country after a nuclear war. As Schelling says; "Maybe one of the reasons why thermo-nuclear war has been likened to 'mutual suicide' is that suicide is often an attractive escapist solution compared with having to go on living."[149]

In a general manner, Schelling says that the U.S. nuclear strategy must be one of intimidation; the U.S. must use its nuclear weapons in order to intimidate and threaten the Soviet Union. It is essential to give the impression that in the event of total war, the U.S. would have the capacity to survive. For Schelling, it is better to use the threat of a reserve force than to use the Eisenhower doctrine of all-or-nothing. Since threatening to launch an all-out nuclear attack in the advent of any kind of misconduct by the Soviets did not allow much flexibility. Also, the use of the no-cities strategy is better than the Kissinger[150] doctrine of using nuclear weapons in limited conflicts since it could also be used in conventional warfare.

The credibility of a nuclear threat, according to Schelling, depends on the ability of one party to convince the other that an aggression on the latter's part will automatically provoke massive retaliation. Schelling wants to profit from the fact that the superpowers are terrified of the threat of nuclear war. He suggests the idea that the U.S. use this fear to their advantage. Thus it would be the Soviets who would have to retreat, or face the consequences of causing a nuclear holocaust. The Soviets, or any communist country, must believe that bad judgment on their part would provoke an inevitable retaliatory action by the U.S. leading, perhaps, to a holocaust. This threat has the advantage of being more credible than what the Eisenhower strategy had to offer, that is conciliation or nuclear war. To be credible, a nuclear policy, according to Schelling, has to communicate the message that a nuclear conflict is inevitable even if the U.S. does not want it. This idea was first developed in the 8th chapter of *The Strategy of Conflict* "The Threat that Leaves Something to Chance". It is also what Peter George in print (*Red Alert*) and Stanley Kubrick in film (*Dr. Strangelove*) used. Schelling even uses the little black box analogy to show that the nuclear

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[149] Schelling (1965)
[150] Kissinger (1969)

warheads would not be controlled by humans in case of an attack. He also uses the concept of deterrence since the aggressor must think about the consequences of committing an aggression.

By provoking a crisis or a local conflict, the aggressor would be playing a very dangerous game, since by doing so he forces the other party to react and creates a situation that could provoke a holocaust. The U.S. should cultivate this fear and could find it advantageous to demonstrate that even a small scale aggression could provoke an incontrollable snow-ball effect that could result in nuclear war. The Eisenhower strategy could hardily be seen as soft but on the other hand it could not demonstrate what it preached without provoking an all-out war. Schelling's strategy, at least he contends, could achieve such a goal. One way of demonstrating this is by using new kinds of armaments in the early stages of a conflict[151] in enemy territory. The primary goal of doing so is not to gain military advantage (in the same way a strategic bombing campaign would) but to simply show the enemy that one has these weapons and would not hesitate to use them[152]. Neither of the parties wants this and the only way of avoiding it, is for the enemy to retreat. This way the enemy cannot only save his own life but humanity's as well (in the case of nuclear weapons).

In the following section, we will see how Schelling uses the Korean conflict to illustrate how conflict theory can have an impact on the military decision of a country and also, its foreign policy.

5.1 The Theory of Conflict and the Korean War

It is helpful to look at the way Schelling analyzed the Korean War. He makes several references to it in his 1966 book *Arms and Influence*. Schelling's point of view on the Korean conflict is primarily historical.

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[151] Schelling is not very clear if this should be done before or during a conflict (Ayson (2000))

[152] One could remember the U.S. Army testing a new kind (its acronym was M.O.T.H.E.R.) of bomb just before the second Irak War.

Here is a short overview of what happened in Korea at the mid-point of the 20th century. After the Second World War, it was decided that Korea would be divided in two, since it had been a Japanese colony since 1910. North of the 38th parallel would be occupied by Soviet Russia, the south would be under the control of the United States military. General Douglas MacArthur would control the area from his headquarters in Tokyo.

In the North, the Soviets and Kim Il-Sung created the North Korean People's Army, equipped with Russian tanks and artillery. In the South, the chaotic political situation resulted in an American-backed administration under the presidency of Syngman Rhee, whose openly declared aim was the imposition of national unity by force. As a result, because the Americans did not want to encourage Rhee, the South Korean Army (who was trained by the U.S.) was small in numbers and had limited equipment.

After several years of bloody frontier incidents, the Republic of Korea was invaded by the North Korean People's Army on June 25 1950. Despite earlier indications, the Pentagon was caught off-guard. The first American troops were sent in to help contain the invasion. However, the North Koreans still advanced rapidly south, aiming to take the vital port of Pusan. The American troops were hurriedly sent from occupation duties in Japan, faring badly against superior North Korean troops, but still managing to prevent the North Koreans from taking the port.

It was not before November of that year, that China decided to intervene. General MacArthur ordered a pursuit which led troops deep into North Korea. As the U.N. troops drew near the Manchurian border, there were ominous signals from Peking that communist China would intervene to defend its territory. With the Chinese intervention, the U.N. troops were forced to retreat, and by early January 1951 they were defending a line south of Seoul. Three months later and for the remaining two years, fighting stabilized.

In mid-1951, with the land battle in a stalemate, both sides agreed to go to the conference table and armistice talks began. They dragged on for two years; in July 1953 an entente was reached.

The conflict was over before Schelling had seriously started to think about conflict theory. He does analyze the conflict in his 1966 *Arms and Influence*. Schelling discusses the Chinese intervention; he does not analyze the reasons why the U.S. decided to intervene against North Korea. First of all, Schelling sees the Korean conflict as the perfect example of a limited conflict. The adversaries, in this case the United Nations (primarily the U.S.), the South Koreans and subsequently the Chinese never decided to use coercive warfare, nor did they threaten to use the others cities as hostages. It was essentially a soldier's war; the fighting was limited to the battlefields. This can also be seen in the nature of the weapons both sides decided to use. These weapons were conventional weapons: neither decided to use nuclear weapons or chemical weapons, which can be used to take a large number of people hostage. The U.S. did not bomb across the Yalu, Schelling gives a lot of importance to the Yalu River; "The Yalu was like the Rubicon. To cross it would have signaled something. It is a natural place to stop; crossing it would have been new strategy."[153] The Yalu River is seen as a focal point, it was a threshold that the U.S. could not afford to cross[154].

The reasons that lead to the conflict, according to Schelling, can be attributed to miscommunication. The U.S.S.R. did not understand the importance of South Korea for the U.S. This importance can primarily be explained by the Truman doctrine. It stated that the communists wanted to literally take over the world. Consequently to let the communists have more influence would start something that could not be controlled. Another result of miscommunication meant that the U.S. did not understand the messages China was sending, trying to signal the importance it attributed to North Korea. This error cannot easily be understood since the U.S. did not hesitate to defend an ally that was half way around the world; how could they think that China would not try to defend its neighbor and ally? But as we will see later there are some possible answers to this question.

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[153] Schelling (1966), p. 134

[154] The problem with this is that it has been said many times that General MacArthur's troops did cross the Yalu (Mclelland (1968)), but never in an official way.

The conflict can also be explained by the fact that the U.S. did not want to lose face. For Schelling the image the leaders of a country want to project is one of the most valuable assets in its foreign policy; "We lost thirty thousand dead in Korea to save face for the United States and the United Nations, not to save South Korea for the South Koreans, and it was undoubtedly worth it."[155]

Two years after the publication of *Arms and Influence* in which the preceding analysis was exposed, Schelling gave a lecture that would drastically depart from his prior work. In September of 1968, he began to distance himself from the ideas he had been expressing for the past decade. Ellsberg, for his part, first started publishing the doubts he had about U.S. foreign policy and namely the U.S. strategy in Vietnam, in June of 1969. The next chapter will examine the reasons the authors give to explain why they were trying to distance themselves from conflict theory.

[155] Schelling (1966), p. 124

CHAPTER VI

SCHELLING AND ELLSBERG TRY TO DISTANCE THEMSELVES FROM CONFLICT THEORY

An event that influenced Schelling's change of mind was what happened in Czechoslovakia in 1968, which became known as the Prague Spring. It also forced Schelling to change his views about a Soviet intervention in Czechoslovakia since he had said, by his own account, many times, that the type of intervention the Soviets did, would not have been possible. It also forced him to reconsider many of his ideas, as the following discussion will show. But first, here is a brief overview of what happened in Czechoslovakia in 1968.

6.1 Prague Spring 1968, an overview

One result of the end of World War I was the break up of the Austrian-Hungarian Empire into different independent states; the birth of the Czechoslovak Republic was one result. In 1935, Tomas Masaryk, the first president, retired. He left the post to his long-time colleague Edvard Benes. During Benes' time as president, he tried to implement democracy, but he had to face many problems, and the most difficult one was the rise of Nazism in Germany. One of Hitler's main aims was to destroy the Treaty of Versailles and to unite all Germans living in other countries. As we have seen, Ellsberg used Hitler's actions as an example in his work.

Hitler demanded the incorporation of a part of Czechoslovakia, named Sudetenland. His request was granted in the Munich Agreement by the Western powers, with the hope of appeasing him, sinced they believed it to be his last territorial claim in Europe. In March 1939, however, Hitler and Germany occupied most of the rest of Czechoslovakia. The importance of the Czech crisis as a background to World War II cannot be underestimated.

Stalin feared a German attack and signed a non-aggression pact with Germany. The German occupation lasted until Czechoslovakia was liberated by Soviet and American forces at the end of World War II.

The communists obtained political power through free elections and, step by step, between 1945 and 1948, Czechoslovakia became a Soviet satellite. The main reason for the Czechs to support communism was that they could not forget that parts of their country had been handed over to Nazi Germany, by the Western powers. Czechoslovakia was now the last outpost against the West. This should be kept in mind since Schelling suggested that, since Czechoslovakia was at the edge of the Soviet bloc, NATO could perhaps use it to its advantage.

On January 5th 1968, the Slovak Alexander Dubcek, who was opposed to the hard-liners led by the current president, managed to win the support of a majority of the Central Committee. Within a short amount of time Dubcek started to loosen the repressive political ropes of the former regime. A wind of democratization started to blow throughout Czechoslovakia; this is what came to be known as the Prague Spring. At a conference in the city of Brno, on March 16th 1968, Dubcek promised a wide democratization for the country and greater autonomy for the government, the courts, the trade unions and economic enterprises.

In April of the same year the Czech Communist Party published its "Action Program". This Action Program deeply concerned the other member-states of the Warsaw Pact. They tried to force Dubcek to take the reform program back, but he refused. After a Warsaw Pact meeting where Czechoslovakia was not invited, the Warsaw Pact leaders sent a letter of their conclusions, stating that they found the Czechoslovak policy totally unacceptable. Dubcek's answer was that his new policy would continue. It was declared on the 22nd of July 1968 that the Warsaw Pact countries would march into Prague to prevent a counterrevolution. It was not before the end of August of that year that the Eastern Bloc countries, except Romania, invaded Czechoslovakia with over 200 000 foreign soldiers on Czechoslovakia soil, the leaders of Czechoslovakia were forced to pledge allegiance to communism.

Czechoslovakia represented too much of a threat to communism and the Warsaw Pact. If it was allowed to break free, there was a risk that other satellites could follow and that the Soviet Union would lose their defensive "moat" of countries, such as Poland, Czechoslovakia and East Germany. Furthermore, if the Czechs decided to join a pro-western policy, it would have posed an important security-policy threat to the Soviet Union. The Western countries had the possibility of placing tactical and strategic nuclear weapons in Eastern Czechoslovakia. It could have totally tilted the balance of power.

The events that have just been presented, as was said before, forced Schelling to reconsider some of his positions. He did so in a conference given on September 21st 1968 for the Institute for Strategic Studies, where he exposes in public for the first time a real change in his line of thinking.

Schelling says that he never would have imagined, or predicted, what happened in Prague just a month before he gave his talk: "I have to confess that within the last 6 months I have predicted in public, not once but several times, that the Russians would not do the kind of thing that in August they did."[156] One of the reasons why Schelling would not have predicted an armed intervention by the Russians is that, in his 1966 *Arms and Influence*, and also in articles up to that date, he develops the idea that some countries lay outside the immediate sphere of influence of either the U.S. or the U.S.S.R. In a subsection titled Discrediting an Adversary's Commitments of the second chapter of the 1966 book, The Art of Commitment, Schelling explains that one should show one's adversary that he should not react the same way to an enemy intrusion or attack on a satellite country or territory as on a direct territory. Schelling gives this example: the US would react differently to an attack on California from an attack on Sweden (Sweden is not and has never been a member of NATO). So the aim is to communicate to your adversary that the territory is outside his direct sphere of influence, which, for example, Czechoslovakia is, in relation to the Soviet bloc. This was not an easy task; one must not forget the Warsaw Pact, which was the Soviet equivalent to NATO. The NATO allies had to make sure that Czechoslovakia was moving gradually further and further away from the Soviet power. "If we make it clear that we

[156] Schelling (1968), p. 2

believe they (Soviets) are obliged to react to an intrusion in Hungary as though we were in the streets of Moscow, then they are obliged."[157] Thus, the NATO allies during the events described earlier were very careful not to show interest as to what was happening, even though this posturing was not very credible. It was clear that the West was very interested in the separation of Czechoslovakia from the Warsaw Pact.

Schelling's surprise at the events can also be explained by the fact that since the NATO powers had not shown interest in Czechoslovakia, the Soviets would not react in a forceful manner. The Soviet bloc, had always been seen as exactly that...a bloc, a very unified unit, "(...), the communist part having cohesion that the rest of the world could hardly aspire to, a suffocating ideology that would suppress and eliminate not only dissent but national and cultural unity, (...)"[158]. This can also be seen as being heavily influenced by the Truman doctrine, which states that the world are separated in two sides, one communist the other not. It was also believed that the communists were willing to risk military intervention to increase their sphere of influence. The events in Czechoslovakia directly contradicted the Truman doctrine; it also showed that 20 years of a repressive regime could not suppress a distinct national identity. This is why Schelling and many others thought that a form of revolution was possible.

[157] Schelling (1966), p. 60 (parenthesis mine)
[158] Schelling (1968), p. 2

6.2 Schelling's conference in September 1968

His September 21st talk was given the title "The Uses of Force in the Nuclear Age"; it focused especially on the book he had written 2 years earlier at the Institute, *Arms and Influence*.

Though it does not disavow what he wrote in 1966 (*Arms and Influence*), he modifies several of his ideas and adds others. It is one of the first times when he publicly criticizes the U.S. government's decisions in Vietnam. Also, he analyzes events that do not reinforce the theory he helped create. The following is an analysis of the talk.

What Schelling would have liked to change or add to his *Arms and Influence* is threefold. It is important to realize that he does not disavow what he wrote and also, it is important to note the difference between Schelling and Ellsberg. Schelling simply wishes "to take it (*Arms and Influence*) as a point of departure, amending it where I think I was wrong and bringing it up to the year 1968."[159] The precision Schelling wanted to bring concerned the use of weapons in *Arms and Influence*, "Forcibly a country can repel, expel, penetrate and occupy, seize, exterminate, disarm and disable, confine, deny access, and directly frustrate intrusion or attack."[160] Schelling had meant this enumeration to be very incomplete. Many had taken Schelling literally and had not seen the list as being inadequate, but in the 1968 talk he says that what he really meant by the list was that, "You can't make people do things with military force"[161]. This precision can also be directly linked to what happened in Prague since the 20 years of military occupation imposed by the communist regime had not changed the populations mind about liberty[162] . As Schelling says, "The cannon of a tank cannot make a man express enthusiasm (...), or make a man vote (...). All it can do is kill him."[163]

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[159] Schelling (1968), p. 4
[160] Schelling (1966), p. 1
[161] Schelling (1968), p. 4
[162] This could be seen as being a very ethnocentric view but the fact of the matter remains that what the Czechs wanted was larger individual liberty.
[163] Schelling (1968), p. 4

What Schelling would have liked to add to his book relates to the use of military force. The use of this force is supposed to make people resolve situations, rather than kill them. One will better understand why this is a very big change in Schelling's thought, when looking at another addition Schelling would have liked to make to his 1966 book. Schelling says, and this is a departure from his previous line of thought, that a government is not like an individual: it does not act or change its mind like people, "Governments indeed are composed of people, but the composition is not equivalent to one large-sized individual who perceives, cogitates and decides."[164] Schelling did have a paragraph that stated essentially the same thing in *Arms and Influence*, but it was only a paragraph and it did not have much impact on the reader as Schelling says "(...) quite insufficient to cleanse my book of the sin of personification."[165] It was not enough to make it clear to the reader that he did not see a foreign government as a person: a lot of what Schelling wrote during the previous years made references to personification.

It also makes a reader ask himself what the impacts of this depersonalization on conflict theory are. It also raises some concerns such as: if one cannot interpret governments as people (and rightly so, some might say), influencing and predicting its actions become very complicated. This precision seems to have been added by Schelling after spending time in government and getting to know its inner decision taking process. (Thus, Schelling is guilty of the personification sin, but tries to repent himself.)

This line of thought brings Schelling to ask himself, "How does a government change its mind?"[166] His answer is that a government changes its mind by changing its complexion. For example, in a democracy it is through elections that a government changes its complexion. The problem with this, according to Schelling, is that in the U.S., for example, this only happens every four years. The direct consequence of this slow reaction time is that a bad decision can affect the political life of a country for 4 years before it can be changed. A striking example of this is the bombing of Hanoi during the Vietnam War. This bombing

[164] Schelling (1968), p. 10
[165] Ibid, p. 10
[166] Ibid, p. 10

campaign was called *Rolling Thunder* and has been directly linked to Schelling and conflict theory[167]. It was a classic example of the "no-cities" strategy that was advocated by Schelling, since it created what was called the "Hanoi doughnut". The bombing was so intense that it destroyed practically everything around Hanoi; it also destroyed what little production capacity North Korea had. The country had to import nearly everything it needed during the conflict from the Soviets and the Chinese. The aim of that bombing campaign was to "(...) raise the costs of the war to the North Vietnamese (...)"[168], to raise it high enough that the North Vietnamese would not want to pursue the war against the U.S. Then again Schelling asks the question "Which North Vietnamese, the ones who feel the pain, or the ones who make the decision?"[169] This is one the reasons that can explain the failure of that particular bombing campaign. It is not sufficient that some North Vietnamese feel the pressure; the decision makers themselves have to see the price of continuing to fight increase.

Another point Schelling would have liked to change, had he written *Arms and Influence* two years later, was his notion of deterrence. It is a concept that Schelling worked on for many years and it is at the center of many of the notions that he developed in *The Strategy of Conflict* and other articles that he wrote in the first half of the 1960's. He now wished to modify the deterrence concept to include the possibility to be so deterred that the thought of taking action against an adversary would not even cross the minds of the decision-makers. As Schelling puts it "(...) so thoroughly deterred that no-one even expected us to intervene, with the result that the high cost of disappointing those expectations could not confront us as a counter deterrent."[170] In an effort to illustrate this, Schelling also gives an example; the NATO member nations were so thoroughly deterred from taking action against the Soviet Union in Czechoslovakia that they did not even attempt to show that they found Czechoslovakia so important as to intervene if the Soviet Union chose to do so. There was no reaction to the Soviet intervention by the U.S. government other than what then vice-

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[167] Kaplan (1983)
[168] Schelling (1968), p. 10
[169] Ibid, p. 10
[170] Ibid, p. 7

president Nixon said about the fact that the U.S. embargo that was already in place against the Soviet Union should continue.
Schelling wanted to take the concept of deterrence even further than before, as far as to say that when deterrence works to its fullest, the thought of taking action should not even cross one's mind. One can also help deter oneself, by never committing oneself, as was the case in Czechoslovakia; the U.S. never committed itself to intervention.

Finally, the third point Schelling would have liked to add to his 1966 publication was the high cost on national unity that the use of violence can have, "(...) if the actual course of the war had been seen as a likely one, the price would have been judged too high."[171] Schelling had never mentioned how the population could react to the decisions a government took during a conflict. Now, seeing how much civil unrest the Vietnam War caused in the U.S., he had to. And his conclusion was that national unity was more important then whatever could be gained by winning the Vietnam conflict.

As for Ellsberg, his dissatisfactions with the U.S government's actions motivated him to publish a series of papers that argued against what the U.S was doing in Vietnam.

6.3 Ellsberg's Lessons of Vietnam

In June of 1969, Ellsberg published for the members of the RAND Corporation a series of papers under the working title of "Lessons of Vietnam". These papers are very incomplete and unpolished but he published them, "in the interest of communication, stimulation, (...) feedback of thoughts and reaction to me."[172] The primary source for these papers where the notes that Ellsberg had collected during the preceding years, especially while he was in Vietnam. He was also, at the time, unknown to anyone, photocopying the *Pentagon Papers* at night.

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[171] Schelling (1968), p. 12
[172] Ellsberg (1969a), p. ii

Ellsberg does not completely disavow the influence of conflict theory on U.S. Vietnam operations. When asked if the limited war doctrine was to be held responsible for the increasingly large-scale intervention in Vietnam, Ellsberg answered to the contrary. He thought that it was the over-confidence on the part of the U.S. in strategic bombing that could be, at least partially, blamed for the large-scale intervention.

> "(...) a widespread belief in the efficacy and acceptability of aerial bombing, and in particular of bombing of a strategic nature, aimed at the will of the opponents (...) This belief played a critical, if not decisive, role in getting us into Vietnam, (...) and then in stimulating escalation while keeping us reassured as to ultimate success."[173]

Keep in mind that operation *Rolling Thunder* was heavily influenced by conflict theory, since its aim was to cause an increasingly high cost of pursuing the war and thus force the enemy to lay his weapons down. Ellsberg, like Schelling, also stresses that this kind of operation, should not last very long "(...) any bombing we may do need not last very long and the resulting damage will not be permanent"[174], the reason being that the result of long term bombing causes irrevocable damage; one does not want to fight an enemy that has nothing to lose. Obviously, this part of what conflict theory preached was not observed. Another problem was the difficulty of communicating with the Viet Cong and the fact that their utility function did not appear to be what the Pentagon bureaucrats perceived it to be. They should have given a lot more importance to resisting enemy forces. It must not be forgotten that the Vietnamese had resisted invasion for over 400 years and had recently defeated the French.

Yet another example of the fact that Ellsberg had not completely lost faith in what conflict theory had to offer in the analysis of conflict situations, was that he never ceased seeing the Vietnam conflict as a negotiation. In "U.S. Aims and Leverage in Vietnam, 1950-65", published in the "Lessons of Vietnam" series, Ellsberg discuses what the U.S. government did and could have done in the hope of winning the Vietnam war In part, Ellsberg sees this failure as the result of bad strategy on the part of the U.S. government. For example, in instances where the wrong message was being communicated; "It is their (South

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[173] Ellsberg (1969b), p. 1
[174] Ibid, p. 3

Vietnamese) fight, and they have to win it"[175], when it should have been . "In view of our national interest, it is our fight, but they have got to win it for us; because if they don't, we might have to."[176] The government was sending the message that it did not value Vietnam as much as, say, California, to use Schelling's example. It was sending the signal, that it did not value Vietnam and, was perhaps not ready to fight as hard as it should to save it. Another example, is how Ellsberg characterizes the U.S. government's learning function (in fact he says that it does not learn, or not fast enough, this being another example of personification), "(...) we are very unlikely to learn fast enough, we must conclude time is strongly against us; and our attitudes in negotiation should reflect this conclusion."[177] Finally, another example is that Ellsberg thinks that the Viet-Cong has understood how to exploit U.S. weaknesses, "The longer we allow the fighting to go on, the more difficulty we will have, because the VC have gotten our number (...)"[178] and that "(...), our bargaining position is likely to get worse over time, not better."[179]

[175] Ellsberg (1969a), p. 2 (parenthesis mine)
[176] Ibid, p. 2
[177] Ellsberg (1969b), p. 13
[178] Ibid, p. 14
[179] Ibid, p. 14

CONCLUSION

It was Schelling and Ellsberg's dissatisfaction with the theory of games as well as the context of the late 1950's and 1960's that motivated them to work on a special branch of decision theory[180]. They created what is now known as the Theory of Conflict, a theory that uses non-zero sum games to find a winning behavior in conflicts. It was also this context which contributed to their subsequent break with the military and the political establishments. One also hopes to have shown what Schelling and Ellsberg wished to accomplish with this theory, which was to bring a conflict to a satisfactory end.

Though one has to keep in mind that the language nuclear-deterrence and thus conflict theory uses is one that is very demanding (counterforce, no-cities, first-strike capacity...), it is a vocabulary that often tends to scare the general public off, and thus the people that are familiar with it (the insiders) can use it to their advantage. The vocabulary can make people believe that the risks of general war, or violence for that matter, are under control. The language can desensitize people towards reality. We are actually talking about using human creations, to threaten, control and ultimately kill other human beings. Schelling and Ellsberg realized this in the early 1970's when they decided to sever their ties with the government and the other insiders.

The release of the *Pentagon Papers* prompted the US government to sue Ellsberg on treason charges, which were eventually dropped. As for Schelling, when he tried (with the other Harvard professors), as was said earlier, to meet with Kissinger in 1970, the latter refused to meet with them, and told them that time would show that the president's (Nixon) decision was the right one. In the article reproduced on Appendix A, Schelling told journalists that the decision to send American troops into Cambodia was "(...) inexcusably and unjustifiably wrong" and that it left him (speaking for the group) "scared about the next decision". He finally added that "(...) several of us said we are now so absolutely dismayed that we are

[180] Even though further work is needed in numerous parts of the project, especially Ellsberg's treatment of threats in his Lowell Lectures.

through collaborating with the executive branch". One can easily understand why Schelling reacted in such a way since Cambodia was a threshold Schelling did not want the U.S. to pass. It was something that resembled the Yalu River in the Korean conflict and could have provoked another nation to join the Viet Cong in their combat against the U.S.

The break also forced Schelling to change the focus of his research, and in the early 1970's he started working on urban development models, formalizing why urban developments are relatively homogenous. Ellsberg on the other hand left the economic research sphere and focused his attention on anti-war lobbying. It is strange to see the parallel between Ellsberg and Albert Einstein whose discovery made the atomic bomb possible and who spent the latter part of his life as an anti-war activist detached from physics. They both worked on military issues (Einstein not directly but his discovery did lead to the creation of the most powerful weapon humanity has ever known) and they both became disillusioned with that world. They, however, used the influence they had earned with the military and strategic spheres for anti-war protests.

It was Schelling who decided to name this special branch of economics the Theory of Conflict. A number of concepts developed by Schelling, Ellsberg and others that worked on conflict theory at one time or another are still influencing game theory and economic analysis. Specifically, Schelling's ideas for the resolution of non-zero sum games have had a lasting influence.

Conflict theory has had influence on military affairs as well as on the strategic aspect of it. The Vietnam campaign was influenced by conflict theory, though Schelling or Ellsberg cannot be blamed for the way it turned out; Schelling wanted it to be a very short campaign, three weeks maximum. Though it could be said to Schelling's and especially Ellsberg's benefit that their actions towards the end of the 1960's and early the 1970's helped put an end to the conflict, the biggest impact probably come from the reaction of the American public. The Cold War was also influenced by conflict theory; its influence was probably a positive one, as there has not been a Third World War, even if it did nothing to appease spirits at that time.

It is amazing to see how concepts that were developed more than 40 years ago are still of importance to this day, even though Schelling admits in the preface of the 1980 edition of *The Strategy of Conflict*, that he hoped for more by publishing the book; "In putting these essays together to make the book, I hoped to help establish an interdisciplinary field (...) The field that I hoped would become established has continued to develop, but not explosively, (...)"[181]

In 2005, Thomas Schelling (with Robert Aumann) was awarded the Nobel Prize in economics for offering "(...) new insights into the dynamics aspects of conflict and cooperation. Thomas Schelling showed us how one party in a conflict can often strengthens its position by overtly worsening or limiting its own options (...)"[182]

[181] Schelling (1980), p. vi
[182] Presentation of the Nobel prize to Schelling

APPENDIX A

Schelling breaks with the Nixon administration on the Vietnam War policy.

6 Urbanists Denounce Nixon Over War Spending
By JACK ROSENTHAL Special to The New York Times
New York Times (1857-Current file); May 11, 1970; ProQuest Historical Newspapers The New York Times
pg. 22

6 Urbanists Denounce Nixon Over War Spending

By JACK ROSENTHAL
Special to The New York Times

WASHINGTON, May 10—Six prominent urbanists publicly denounced today the "dangerous" impact of what they called the President's preoccupation with Southeast Asia on the crisis of the cities.

They said they did not believe the Administration understood the depth of disillusionment in universities and ghettoes fostered by the President's decision to send troops into Cambodia.

The six men, including two former high officials of the Johnson Administration, came to Washington late today to express their views to Daniel Patrick Moynihan, a former colleague and a counsellor to the President.

They said they could, in conscience, no longer offer formal or informal advice to the White House.

The Other Five

Charles M. Haar, a Harvard University law professor and associate director of the Harvard-Masachusetts Institute of Technology Joint Center for Urban Studies, said one pur-

Say His Preoccupation With Asia Leaves Cities' Crisis 'Dangerously Unmet'

realigned," Mr. Haar said. "The crisis of the cities remains dangerously unmet."

The five others are Robert C. Wood, Secretary of Housing and Urban Development for a brief period and Mr. Moynihan's successor as director of the Joint Center for Urban Studies; William A. Doebele, Harvard professor of design; Bernard J. Frieden, M.I.T. professor of planning; Lee Rainwater, Harvard professor of sociology, and Alonzo S. Yerby, associate dean of Harvard's school of public health.

Their action today followed a public break with the Administration by a group of Harvard foreign policy experts. That group met Friday with Dr. Henry A. Kissinger, President Nixon's chief national security aide, to express their disapproval of the Administration's Southeast Asian policies.

Mr. Haar, a former Assistant Secretary of H.U.D., said that the urbanist group was con-

He said the group has n complaint with Mr. Moynihar "In fact, part of our purpose i to strengthen his voice and hi hand in the Administration—t call attention to the effects c apparent indifference to cit needs," he said.

The earlier meeting with M Kissinger was attended by I Harvard professors who ,hac variously, advised four Pres dents.

One of the participant Thomas C. Schelling, said the described the President's dec sion to send American troop into Cambodia as "inexcusabl and unjustifiably wrong." left them "scared about th next decision."

Though long-time colleagu and friends of Mr. Kissinge "several of us said we are no so absolutely dismayed tha we are through collaboratin with the executive branch Mr. Schelling said.

When the group objected t an off-the-record discussio Mr. Kissinger fell largely silen "He said that a year from no we would go along with th President's decision, and litt else," Mr. Schelling said.

Mr. Schelling said he returne to Cambridge so discourage that he intended now to begi

APPENDIX B

Article where Schelling wants to inform and involve the public on the implications of arms controls treaties.

Letters to The Times

Disguising Arms Control

Strong Soviet Motivation Toward Disarmament Doubted

The writer of the following letter is a Professor of Economics at Harvard University and a member of the faculty of the Harvard Center for International Affairs.

To the Editor of The New York Times:

It is generally reported that the American participants at the recent conference of scientists in Moscow returned convinced that the Soviet Government is strongly motivated toward disarmament and prepared to make important concessions. My own impression of the conference was different.

The Soviet participants did display a strong interest in total disarmament, along the lines of the official Soviet proposals, and in reconciling their interest in total disarmament with the American interest in inspection. Two observations lead me to discount this evidence.

It is easy to see that the Soviet Government can gain from displaying an interest in disarmament, and furthermore might gain a variety of advantages from a treaty committing the United States and others to the rapid total dismantlement of military forces and armaments. That every effort is made to display such an interest—even that the Soviet Government would like a treaty—is therefore poor evidence of intent to participate in actual disarmament.

This is not to deny such intent, but only to question whether new evidence was obtained from nine days of demonstrations.

Second, there was no evidence that the Soviets had given serious thought to the problems raised by their own disarmament proposals. Disarmament is complicated business, as difficult as any major innovation in military strategy, or more so. It is not obvious that disarmament, once achieved, will not be followed by a new arms race, or that the danger of accidental war will disappear once the process of disarmament starts; the ambiguities, misinterpretations, and the rapid military adaptations required could enhance the danger of false alerts, unauthorized action, or military

There is genuine argument, even among those who believe in disarmament, whether total disarmament is a meaningful goal. I saw little evidence that these problems have received attention commensurate with their importance to a country that seriously considers disarming itself.

Derogation of Inspection

The Russians act as though only Americans are interested in inspection. But given the professed Soviet suspicions of American military policy, their derogation of inspection is hardly compatible with a serious intention to disarm themselves. Their lack of interest in any arms regulation other than total disarmament on a prescribed schedule could be a desire to get on with the central business. It could also be a lack of interest in reducing urgently the danger of war.

So I am doubtful whether we can report new evidence of serious Soviet interest. The interest may be there. If not, it may be cultivated. The Soviet Government cannot afford, any more than we can, to treat arms control solely as a matter of propaganda. This country has probably also not given persuasive evidence that arms control is serious business.

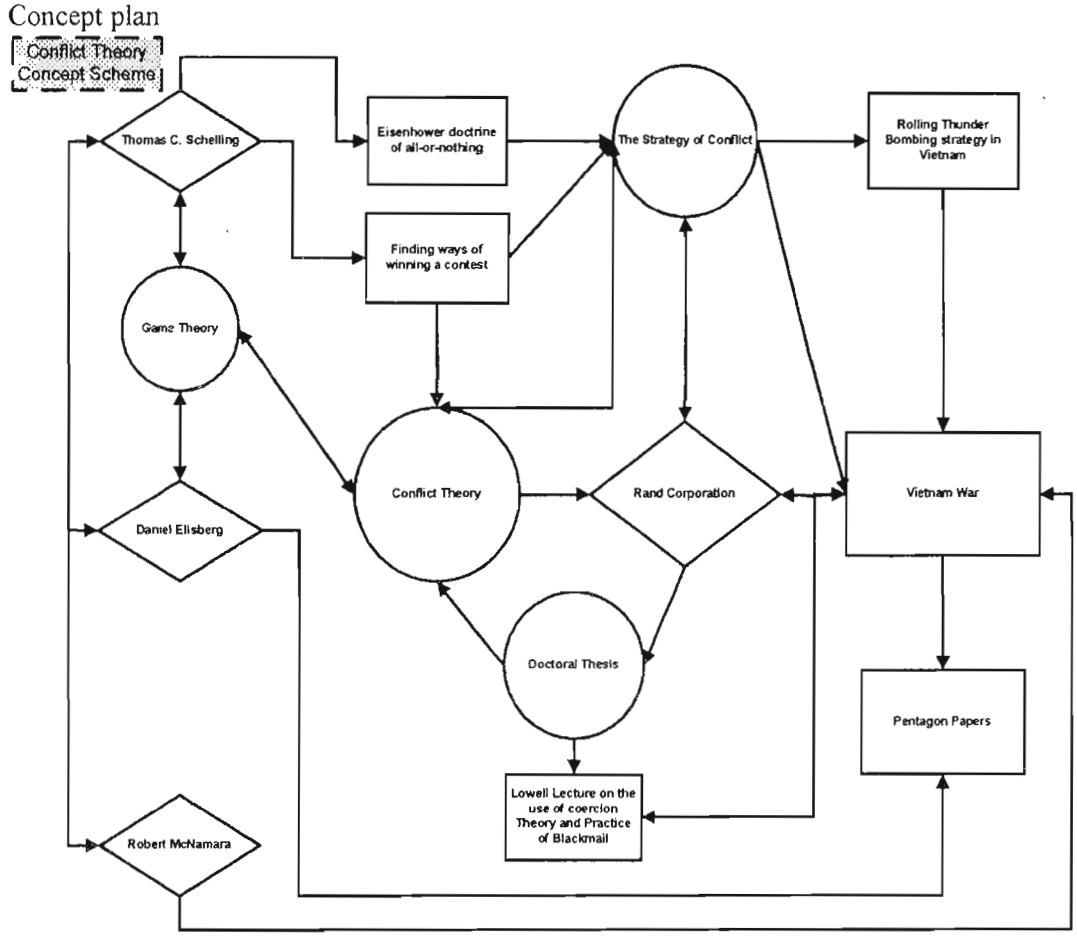
The progress of arms control will be seriously retarded by exaggerated expectations or by a belief that the technical problems will dissolve once a decision to disarm is taken. Whatever the conference accomplished, it did not persuade me that the Soviet Government has thought its way through the subject enough to warrant radical decisions.

THOMAS C. SCHELLING.

Cambridge, Mass., Dec. 27, 1960.

APPENDIX C

Concept plan



APPENDIX D

Schelling's involvement in arms control

ROLE OF EXPERTS ON ARMS DECRIED

Politicians Said to Abandon War and Peace Questions

By MICHAEL T. KAUFMAN

A professor has charged that questions of peace and nuclear war have been abandoned by political leaders and have been turned over to experts who are not responsible to any political group.

Prof. Irving L. Horowitz, who teaches sociology and anthropology at Hobart and William Smith Colleges in Geneva, N. Y., made the charge in a pamphlet published recently by the American Friends Service Committee. He elaborated on his views in an interview last week.

Professor Horowitz, discussing problems of disarmament, contends that too many decisions have been left to what he calls the "new civilian militarists."

He says that Herman Kahn of the Hudson Institute, formerly of the Rand Corporation, and Henry A. Kissinger and Thomas Schelling of Harvard University, are the leaders of this group.

"These are the men," Professor Horowitz says, "who believe in the balance of terror, who feel that we must proceed with reason and think about the unthinkable."

Professor Horowitz believes that their position is politically unrealistic. He declares:

"If they accumulate data and feed them into a computer and then determine that such and such data will be the most propitious time for dropping the bomb on the Soviet Union, so what? We're not going to push the button anyway."

The professor says these men use reason in making strategic calculations for a postulated war, "yet they can't see how reason can be used to prevent conflict."

"Because we are everything in terms of an East-West power conflict," the professor says, "we are incapable of initiating any original action on disarmament, though we can accept proposals offered by others."

Professor Horowitz contends that much of the thinking on disarmament and related issues is invalid because it is based upon a "two-nation arms race." This, he says, is an obsolete view.

The author emphasizes that his differences with the "new civilian militarists" are not differences of morality. He believes that discussions between them and those who support his own view are "essential to clear the air of the ambiguity surrounding their positions."

RAISES QUESTIONS: Prof. Irving L. Horowitz of Hobart and William Smith Colleges, who disputes the U. S. approach to problems of war and peace.

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